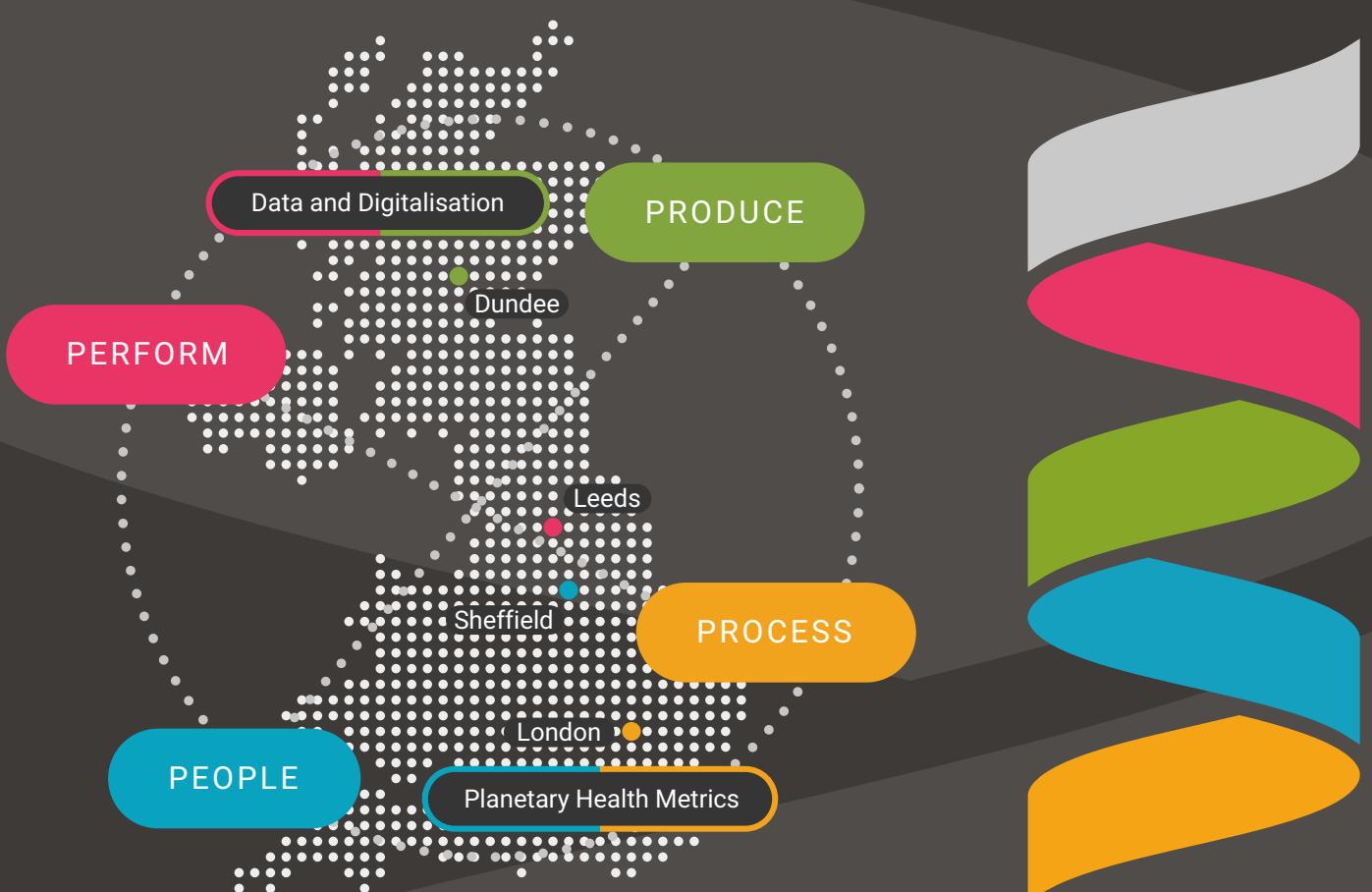


Annual Report 2025

Leveraging the UK's world-leading science and innovation strengths in alternative proteins



info@napic.ac.uk



napic.ac.uk



@napic

Welcome to NAPIC



Professor Guy Poppy

CHAIR, NON-EXECUTIVE BOARD

On behalf of the Non-Executive Board, I am delighted to present NAPIC's inaugural annual report. Tasked with providing governance and strategic stewardship, the Board is proud to see NAPIC exceed its foundational goals and establish a strong platform for long-term sector leadership.

NAPIC was established to address a critical national imperative: positioning the UK as a global leader in sustainable, resilient food systems.

We are encouraged to see NAPIC rapidly mature into a strategic, commercially focussed platform that mitigates the risks inherent in emerging sectors by enabling structured collaboration. I was particularly pleased to see this exemplified at NAPIC's inaugural conference in Sheffield where delegates from right across the food system met. The excitement of the conference was ever present, even retaining significant attendance at my closing address after two days of extensive talks and activities.

The pace and quality of delivery this year reflect strong operational leadership and a clear strategic vision.

Crucially, the Board is committed to responsible stewardship of the foundational investments from

BBSRC and Innovate UK. In line with best governance practice, we have expanded Board membership to include independent representatives from the food production and innovation funding sectors.

The diversity of our Board ensures NAPIC's strategy remains grounded in delivering long-term societal and economic value.

The Board extends its thanks to the CEO and four academic Co-Directors for their expert leadership and to the entire NAPIC team for their exemplary delivery.

We look forward to supporting NAPIC as it scales its impact to sustain this vital mission for the UK food system.



Imran Afzal

NAPIC CEO

As I reflect on NAPIC's inaugural year, I am proud to share NAPIC's first annual report – a milestone that reflects both rapid progress and the collective ambition of our growing community.

Established to catalyse innovation in the UK's alternative protein sector, NAPIC has rapidly become a dynamic, commercially-minded innovation ecosystem bringing together startups, SMEs corporates, researchers, investors and policymakers to accelerate sustainable food system transformation.

3. PREPARE A DIVERSE WORKFORCE FOR THE FUTURE

Building talent pipelines is essential for sector resilience. This year we were excited to launch the first in a planned portfolio of short industry training courses, focussed on mouthfeel and the perception of food texture which is a critical sensory dimension for consumer acceptance. Alongside this we also launched our entrepreneurial training programme, Sustainable Entrepreneurship for Emerging Diets (SEED). Together these efforts will equip the next generation of innovators with the skills to lead a revolution in alternative proteins.

4. FACILITATE ACCESS TO INNOVATION FACILITIES

We are gearing up to map the UK facility and infrastructure landscape to connect existing assets and identify current gaps. This resource will serve the entire ecosystem, enabling NAPIC to support matchmaking and drive deeper collaboration, as well as guide future strategic investments. It is a cornerstone of our vision to make the UK a global hub for alternative protein innovation.

Looking ahead, NAPIC is poised to scale its impact. We remain committed to commercial agility, scientific rigour and collaborative delivery.

NAPIC's foundations are strong, our community is growing, and the possibilities ahead are extraordinary. Together, we are building a better food system, one innovation at a time.

In just twelve months, NAPIC has built the foundations of a national movement driving sustainable protein innovation. Our network of partners is expanding weekly, reflecting the sector's appetite for collaboration and NAPIC's unique role as a convening force.

We are deeply grateful to our funders, BBSRC and Innovate UK, and our partners, whose vision and support have enabled this ambitious endeavour.

NAPIC's success is powered by the dedication of our community and the outstanding leadership of our four academic Co-Directors. I want to sincerely thank our partners, members, the Research & Innovation Fellows, and the entire NAPIC team for their relentless commitment. Their combined expertise, insight and energy have shaped NAPIC's success and direction.

Since NAPIC launched in August 2024, the scale of activity across the consortium has been remarkable. This report shares those accomplishments in detail, but here I wanted to reflect on the highlights across our four activity streams.

1. ADDRESS INNOVATION CHALLENGES

The launch of the Collaborative Programme Funding (CPF) was the standout achievement of 2025. Designed to tackle sector-wide barriers, this initiative has seeded high-impact projects that unite industry and academia. It exemplifies our mission to drive commercially viable innovation through strategic partnerships.

2. CREATE A DYNAMIC NATIONAL KNOWLEDGE BASE

NAPIC is playing a central role in developing a roadmap for a UK National Protein Strategy. By convening expert voices and synthesising evidence, we are helping to define a roadmap for alternative proteins that balances sustainability, nutrition, and economic growth.

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Vision

To make alternative proteins mainstream for a sustainable planet.

Mission

To be the innovation enabler for rapidly evolving alternative protein industries, delivering a universally healthy, acceptable, accessible, eco-friendly food system by harnessing the UK's worldclass science.



Values

IMPACT CENTRIC

NAPIC is purpose-driven, empowering our community and championing shared social responsibility.



RESPECT

We act with kindness, compassion and empathy, creating a supportive environment for the wellbeing of the team.



INTEGRITY

We take ownership of our work with positive intent and accountability.



OPEN COMMUNICATION

We are approachable, inclusive and transparent in communication.



FREEDOM

We encourage independent thinking and create space for creativity.



UNIFIED

We act as one team with shared goals and a clear purpose.



INSPIRING LEADERSHIP

We empower others, foster trust, and guide with purpose and clarity to create a high-performing team.



Knowledge Pillars

NAPIC is built on four interdisciplinary knowledge pillars, covering the entire value chain of alternative protein supply – from discovery to innovation to commercialisation – to address innovation challenges across various focus areas and sectors. These are:

PRODUCE: EXPANDING THE VIABLE PROTEIN PORTFOLIO

NAPIC is pioneering research into novel protein sources, including plant-based proteins, microbial fermentation, micro- and macro-algae, insect feedstocks and the emerging area of cell cultured (cultivated meat) products. This pillar aims to enhance the nutritional, functional, and economic viability of these sources while embedding circular bio-economy principles to optimise resource efficiency. Additionally, it prioritises a just transition for traditional food producers, ensuring that alternative protein integration strengthens, rather than undermines, existing agricultural systems.

PROCESS: DRIVING COST-EFFICIENT, SCALABLE PRODUCTION

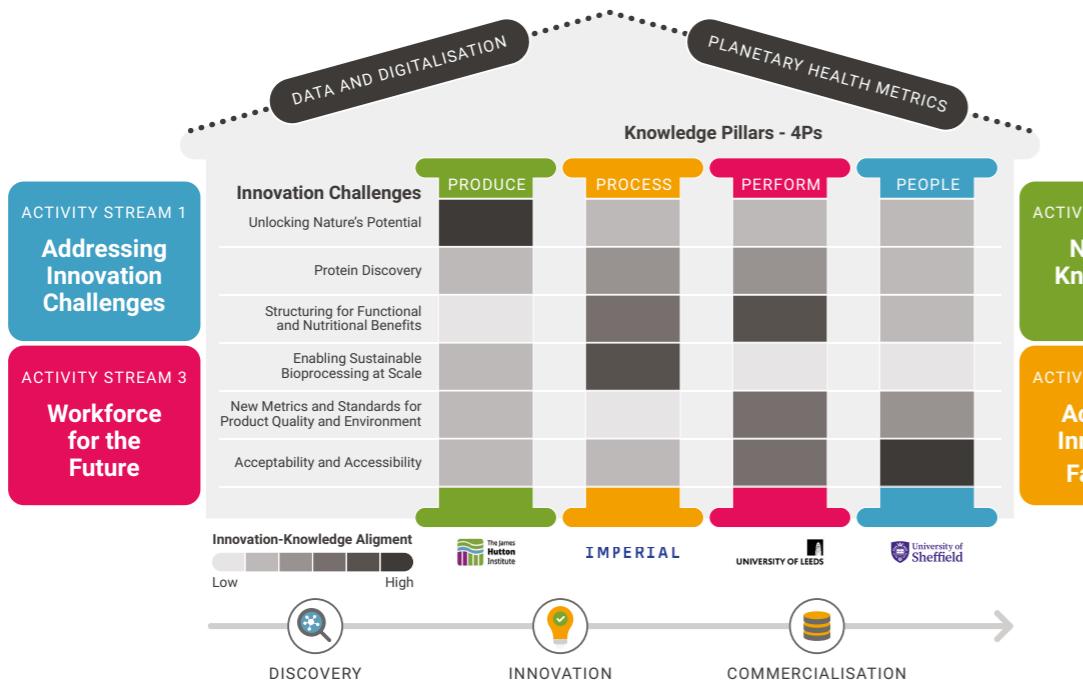
Many alternative proteins remain prohibitively expensive for mass adoption. The PROCESS pillar seeks to unlock cost efficiencies through advances in manufacturing systems. By integrating alternative proteins into existing UK manufacturing infrastructure, NAPIC aims to develop a roadmap to cost parity that accelerates affordability and scalability.

PERFORM: OPTIMISING CONSUMER EXPERIENCE AND HEALTH OUTCOMES

Consumer adoption depends not only on accessibility but also on perceived value. NAPIC employs multi-scale sensory analysis, AI-driven formulation, and human nutritional tools to improve the performance of alternative proteins pre- and post-consumption. Ultimately, this pillar aims to enhance taste, texture, and health benefits of consumption of alternative proteins. This pillar also critically evaluates ultra-processing concerns and allergenicity, ensuring that alternative proteins align with public health objectives and national dietary guidelines.

PEOPLE: SHAPING CONSUMER PERCEPTION AND INDUSTRY ADOPTION

Consumer acceptance of alternative proteins will require tasty, nutritious, safe, and affordable alternative protein products. The PEOPLE pillar employs behavioural science expertise and methods to understand how to increase acceptance of affordable, healthy, alternative protein-based foods by consumers. Behavioural shifts towards regular consumption by present and future consumers require alternative protein producers to gain and retain people's confidence in these products (whether for food or feed), and to reduce anxiety about processing. We need to offer a just-transition for farmers, by identifying new business opportunities, future-proofing the UK's protein supply against reliance on imports.



Knowledge Pillar Leads

CO-DIRECTOR, PERFORM PILLAR



Professor Anwesha Sarkar
UNIVERSITY OF LEEDS

Anwesha Sarkar is a Professor of Colloids and Surfaces at the University of Leeds and is the Project Leader for NAPIC. Her work focuses on oral processing, taste and texture of alternative proteins. Her work includes development of a biomimetic tongue-like surface to measure in-mouth friction, which is now being used by food, ingredients and allied soft matter companies to measure the astringency, texture and mouthfeel of alternative proteins. Current research also seeks to develop technologies such as microgelation, selective enzymatic hydrolysis and glycation to improve mouthfeel of alternative proteins.

CO-DIRECTOR, PRODUCE PILLAR



Professor Derek Stewart
JAMES HUTTON INSTITUTE

Professor Derek Stewart is director of the Advanced Plant Growth Centre (APGC), a £30M Tay Cities deal regional development project hosted at the James Hutton Institute. For over 30 years, Derek has worked at the industry-academia interface and has led multiple international multi-partner projects that, to date, total ~£300M. As director of the APGC he oversees the novel research of pre- and post-harvest innovation, including controlled environment agriculture and crop storage etc.

CO-DIRECTOR, PEOPLE PILLAR



Professor Louise Dye
UNIVERSITY OF SHEFFIELD

Professor Louise Dye is a Chartered Health Psychologist and Co-Director of the Institute for Sustainable Food at the University of Sheffield. Her research examines effects of nutrition on cognitive function, health and wellbeing and how to encourage and sustain dietary behaviour change at individual, organisational and societal levels. She has expertise in the design of both lab-based experimental studies and free living interventions. Louise is Co-Director of the SFI/DAERA/UKRI funded Co-Centre for Sustainable Food Systems and leads a work package on increasing dietary fibre intake in low-income consumers in the UKRI funded H3 project.

CO-DIRECTOR, PROCESS PILLAR



Professor Karen Polizzi
IMPERIAL COLLEGE LONDON

Karen Polizzi is a Professor of Biotechnology in the Department of Chemical Engineering at Imperial College London. Her group applies synthetic biology tools to the development of upstream bioprocessing including strain engineering and the development of new analytical technologies. Karen has expertise in precision fermentation and cultivated meat. She is also Vice Director of the Bezos Center for Sustainable Protein and the Engineering Biology Microbial Food Hub.

NAPIC's Journey: A Year in Review



AUGUST 2024

NAPIC Funding Announcement

BBSRC and Innovate UK announced £16 million investment in NAPIC (£38M with added stakeholder support), co-led by the University of Leeds, the James Hutton Institute, the University of Sheffield and Imperial College London.



NOVEMBER 2024

NAPIC Launch Event & Partner Engagement

NAPIC formally launched with a celebration event at the University of Leeds, attended by over 250 delegates. Workshops brought delegates together to shape and prioritise research and innovation needs for the alternative protein sector.



FEBRUARY 2025

NAPIC Partner Engagement Workshop Report publication

Shared valuable insights on addressing NAPIC's six Innovation Challenges captured at NAPIC's Partner Engagement Workshop.



MARCH 2025

Research Fellow Media Training

NAPIC supported a science communication and media training workshop for NAPIC researchers, in collaboration with the Good Food Institute.



MAY 2025

Collaborative Programme Funding (CPF) Round 1 Launch

NAPIC's inaugural CPF call was launched with CPF Roadshow events across the UK, engaging regional stakeholders and supporting collaboration formation.



JUNE 2025

CEO Recruited

Imran Afzal joins as NAPIC CEO.



JUNE 2025

NAPIC expands global collaboration with international MoUs

NAPIC announced the signing of MoUs with leading institutions worldwide.



AUGUST 2025

NAPIC Membership Launch

Individual membership is launched to provide priority access to opportunities and support the NAPIC community.



SEPTEMBER 2025

NAPIC Inaugural Conference 2025

NAPIC's first conference brought together over 350 delegates and 28 sponsors from the community to foster collaboration and advance alternative protein innovation.



SEPTEMBER 2025

CPF Round 1 Awards Announced

Funding awards announced for the first CPF round involving 14 lead research organisations and 36 non-research partners across 29 projects awarded with £2.6M total project value.

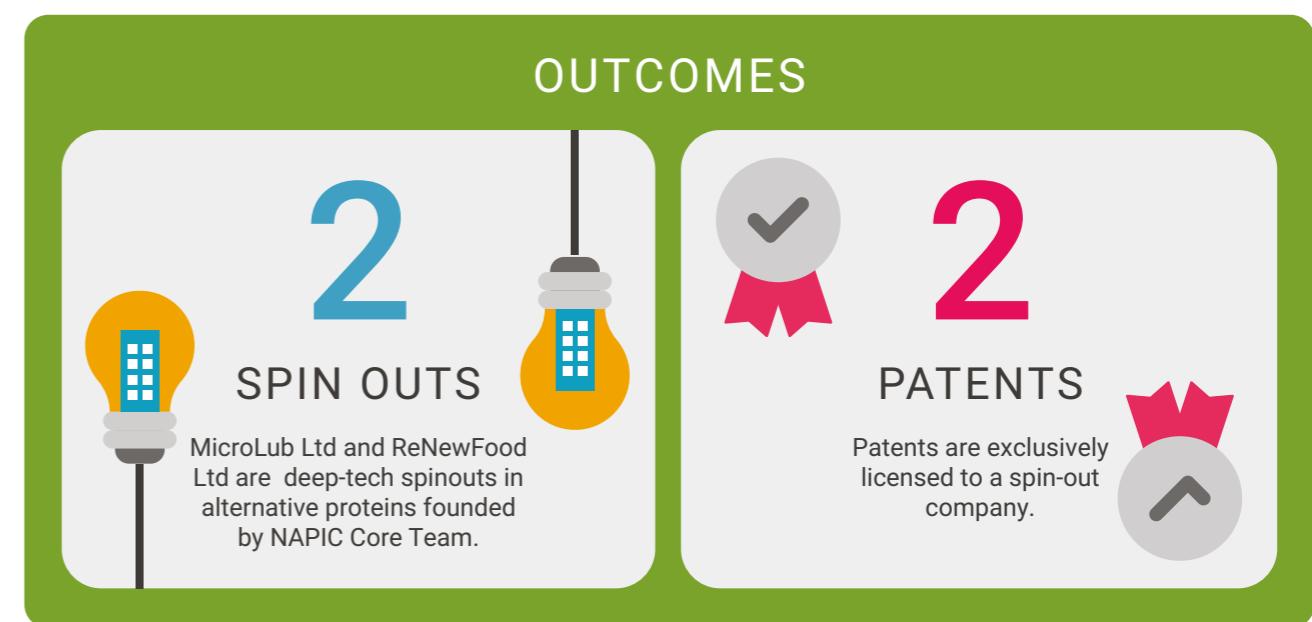
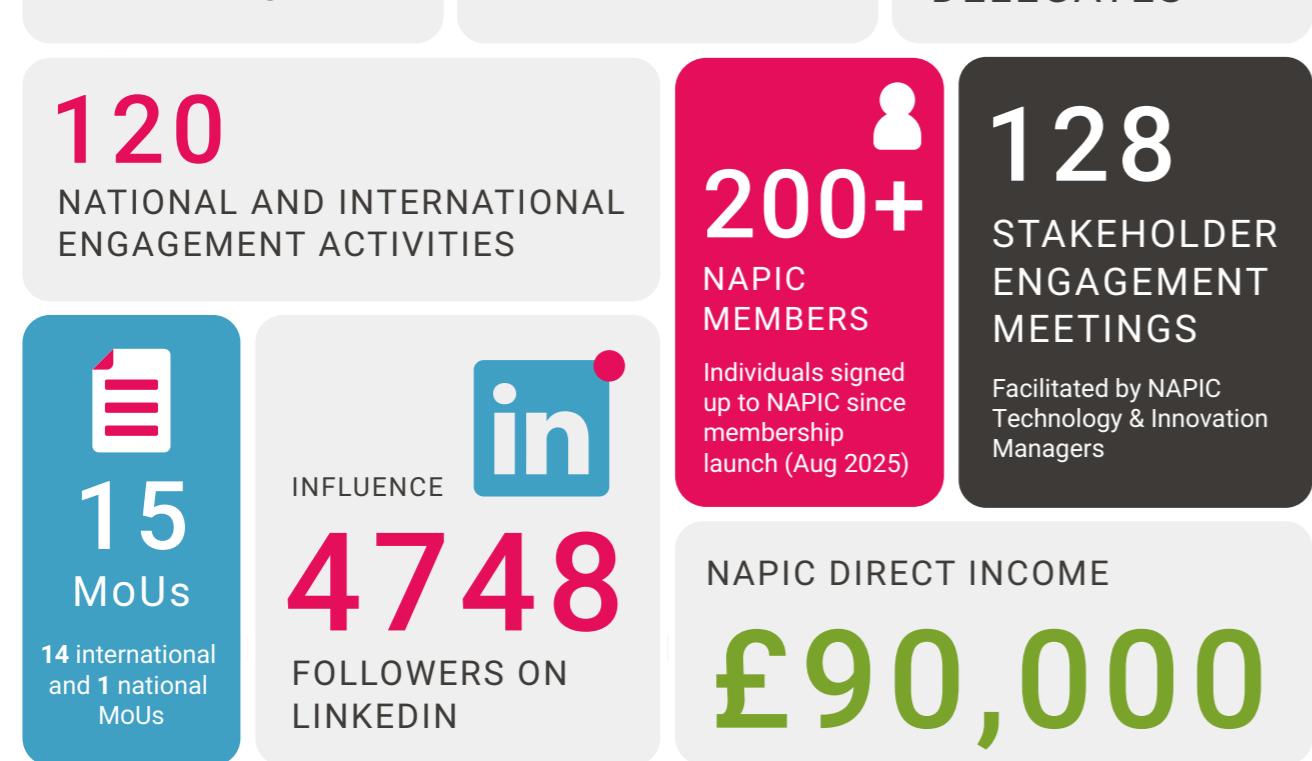
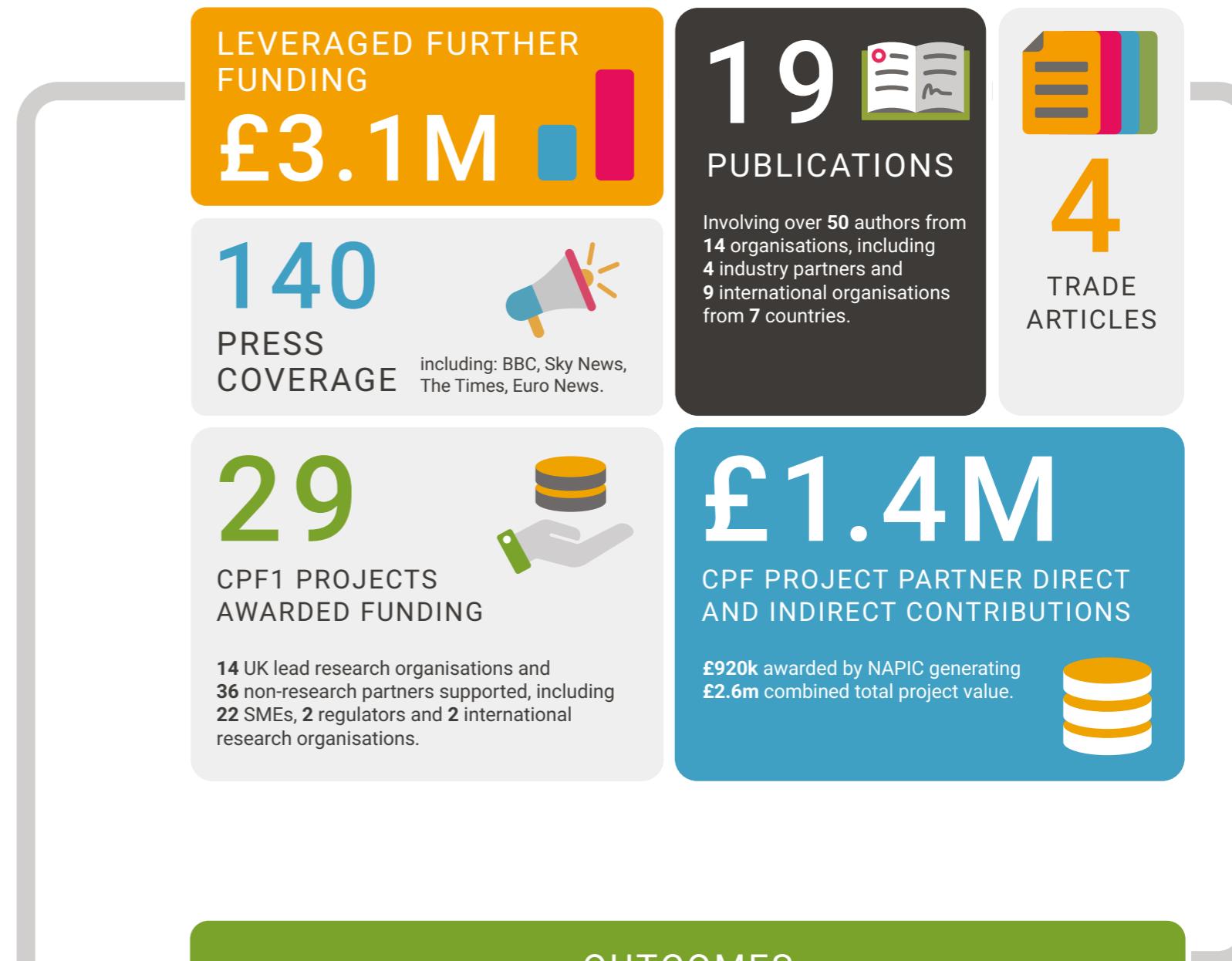


OCTOBER 2025

Intellectual Property Training

NAPIC led a joint initiative training workshop on IP and commercialisation for 60 early career researchers across the UK.

NAPIC's Pathway to Impact



Creating an Innovation Ecosystem

INDUSTRY PARTNERS



RESEARCH PARTNERS



ACTIVITY STREAM 1

Addressing Innovation Challenges

Frontier Research | NAPIC Research & Innovation Fellows
| Collaborative Programme Funding (CPF) | Case Studies |
CPF1 Full Project List

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ACTIVITY STREAM 2

National Knowledge Base

NAPIC Spin-out Spotlight | International Engagement | Policy Engagement | NAPIC Conference | Outreach Activities | Celebrating Excellence: IMechE

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ACTIVITY STREAM 3

Workforce for the Future

NAPIC Research & Innovation Fellows | Media Training for Future Leaders | SEED: NAPIC's Entrepreneurial Programme

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ACTIVITY STREAM 4

Access to Innovation Facilities

NAPIC Partnerships | The Scale-Up Challenge

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Activity Stream 1: Addressing Innovation Challenges

NAPIC's goal is to accelerate the UK's transition to a resilient, competitive and sustainable protein economy. Activity Stream 1 addresses six alternative protein Innovation Challenges (ICs) through two complementary interdisciplinary research approaches:

- **Frontier Research** for discovery and early-stage innovation
- **Collaborative Programme Funding (CPF)** to accelerate translation and commercialisation

Together, these research approaches ensure that NAPIC is simultaneously delivering long-term scientific discovery and addressing near to mid-term sector challenges, creating a pipeline of investible innovations, new standards and commercial opportunities.

NAPIC's 6ICs were co-designed through pre-award co-creation and partner engagement workshops which brought together academic and industry leaders, investors, regulators, and third-sector organisations to identify challenges in the UK alternative protein sector. NAPIC's first year has focused on deepening partner engagement, validating priorities and co-designing innovation pathways. In September 2025, the NAPIC Inaugural Conference brought together the national community to review progress, share its learnings and refine its challenge focus. These activities have generated new collaborations, NAPIC/industry co-funded projects, and a shared vision for addressing the Innovation Challenges.



Unlocking Nature's Potential

Expand beyond today's limited protein sources by discovering, valorising and characterising novel crops, algae, fungi, insects, food-system by-products and cell cultivated products. This includes understanding safety, nutrition, functionality and regulatory pathways, supported by new analytical tools, shared databases and scalable supply chains.



Protein Discovery

Identify, characterise and formulate new or previously underutilised protein molecules, blends and ingredients with targeted functionality, sustainability advantages and cost-effectiveness. This includes standardised testing, scalable production quantities, *in vivo* and *in vitro* evaluation, and ensuring new ingredients meet consumer expectations on nutrition, taste and price.



Structuring for Functional and Nutritional Benefits

Develop next-generation products with improved sensory attributes, performance and nutrition, matching or surpassing animal proteins. Priorities include complete amino acid profiles, digestibility, sensory attributes, sustainable processing, and scalable manufacturing infrastructure that supports tailored product design.



Enabling Sustainable Bioprocessing at Scale

Overcome scale-up bottlenecks by creating access to food-safe pilot facilities, shared supply chains, techno-economic modelling, digital twins and automation. Aims include de-risking investment, shortening development cycles, and supporting SMEs to transition from lab-scale to commercially viable production.



New Metrics and Standards for Product Quality and Environment

Develop transparent, science-based and consumer-friendly standards for quality, sustainability, safety and labelling. Includes harmonised test methods, environmental metrics, allergenicity data, and clear communication to inform regulators, investors and the public.



Acceptability and Accessibility

Build consumer trust through taste, affordability, transparency and compelling evidence. Address perceptions of ultra-processing, expand access through retail and food-service channels, and co-design products with behavioural scientists, chefs and cultural experts to broaden societal uptake.

Frontier Research

NAPIC's Frontier research focuses on discovery and early-stage innovation (TRL1-2), generating new scientific knowledge, intellectual property and standards essential for shaping regulation and future investment. This programme is underpinned by the initial BBSRC and

Innovate UK investment and matched institutional and industry support, enabling a highly skilled cohort of NAPIC Research & Innovation Fellows and PhD students (match funded by the co-lead organisations) to drive breakthrough science across the 6ICs.

NAPIC Research & Innovation Fellows

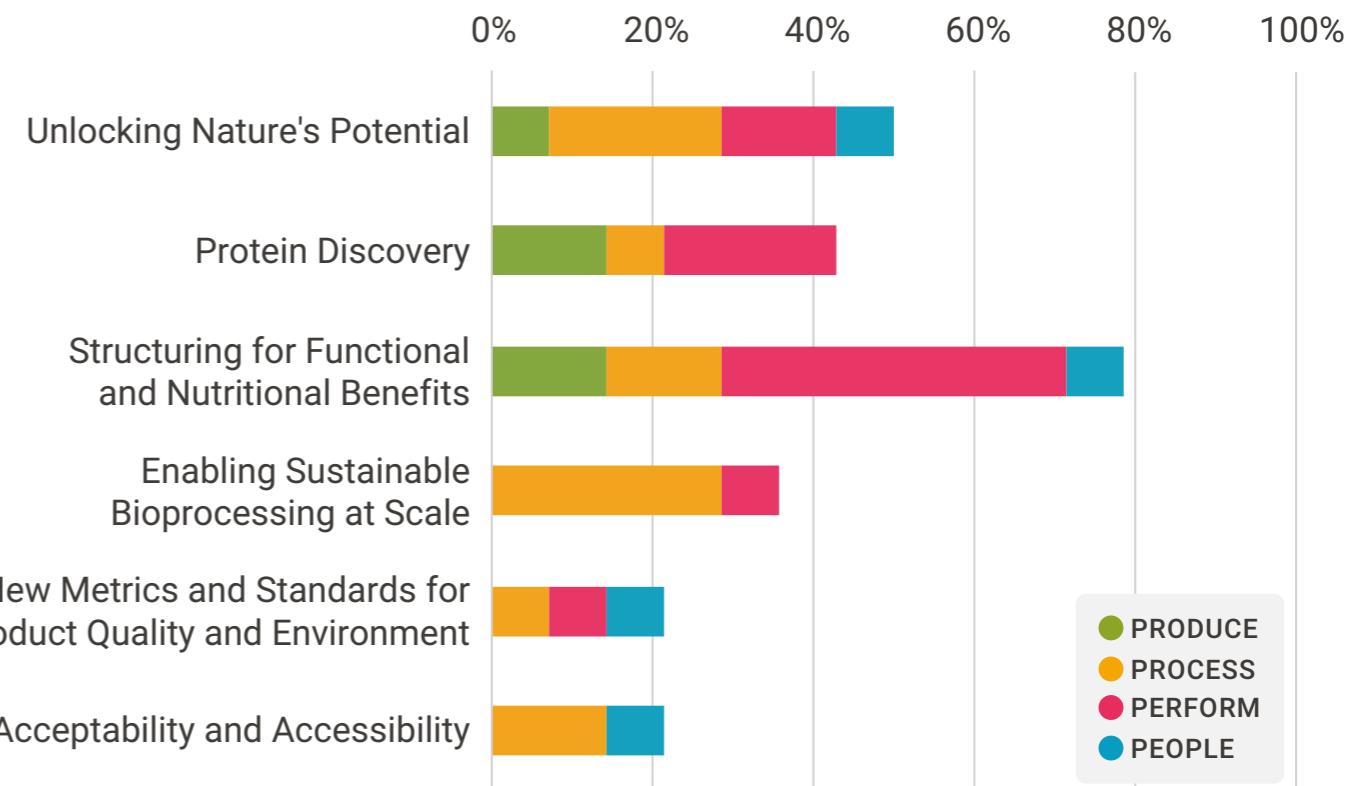
NAPIC's Research and Innovation (R&I) Fellows are central to accelerating the UK's leadership in alternative proteins and addressing NAPIC's innovation challenges. Designed to cultivate interdisciplinary talent and foster cross-pillar collaboration, NAPIC's programme brings together early-career researchers and emerging leaders from across biology, engineering, social science, and food technology.

Each Fellow plays a crucial role in advancing the science, technology, and societal understanding required to transition towards sustainable, high-quality, and nutritious protein systems. By embedding Fellows within NAPIC's four core pillars: PROCESS, PEOPLE, PERFORM, and PRODUCE, the programme ensures that innovation spans the entire value chain, from crop and cell production to consumer acceptance and product performance.

Through NAPIC's Frontier research projects, the Fellows are directly tackling the 6ICs and the collaborative structure of the programme also facilitates knowledge transfer across academic, industrial, and policy partners, ensuring that discoveries translate into real-world impact.

The Fellows are supported by comprehensive training and development scheme coordinated by NAPIC's Future Leaders sub-committee. Designed to nurture a new generation of scientists capable of bridging technical excellence with societal relevance, this investment in developing its R&I Fellows represents a long-term commitment by NAPIC to produce the academic and industrial leaders of the future.

How the R&I Fellows research maps across the pillars and innovation challenges



James Hutton Institute



Dr Marta Maluk | PRODUCE

CROP BIOLOGY

Marta, a plant biologist, investigates protein crop improvement, antinutritional factors and environmental drivers of protein optimisation.



Dr Ruixian Han | PRODUCE

PROTEIN MATERIALS SCIENCE

Ruixian studies how crop genetics and growing conditions shape protein functionality and nutritional quality, linking agricultural inputs to ingredient performance.



Dr William Spittal | PERFORM

GUT MICROBIOME

William studies how alternative proteins interact with gut microbiota and influence metabolic outcomes. He develops AI-assisted frameworks for designing nutritious, gut-supportive protein foods.



Dr Maria Manzanilla Valdez | PERFORM

PRODUCT QUALITY

Maria focuses on plant protein biochemistry and functionality. She investigates how protein structure affects nutritional and sensory performance to improve next-generation formulations.



Dr Tom Bailey | PERFORM

COLLOID CHEMISTRY

Tom works at the interface of colloid chemistry, materials characterisation and machine learning. He designs plant-based emulsions and identifies sustainable replacements for casein and gelatin.

Imperial College London



Dr Alice Grob | PROCESS

SYNTHETIC BIOLOGY

Alice specialises in genetic engineering and gene expression control. She develops modular DNA–RNA–protein toolkits and engineered mammalian cell lines to support controlled sensing and functional trait incorporation for cultivated meat.



Dr Beatriz Felices Rando | PROCESS

TEA & LCA

Beatriz is an expert in techno-economic and life-cycle analysis. She evaluates the scalability, sustainability and economic feasibility of emerging biomanufacturing platforms to guide investment and R&D strategy.

University of Leeds



Dr Taskeen Niaz | PERFORM

DIGESTION & BIOAVAILABILITY

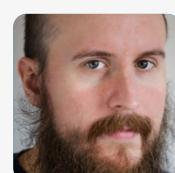
Taskeen specialises in nutrient bioavailability. She examines gastrointestinal interactions to inform safe, effective protein ingredient design.



Dr Ben Kew | PERFORM

ORAL LUBRICATION & MOUTHFEEL

Ben explores tribology, rheology and sensory perception. He builds multiscale models linking protein structure to mouthfeel and astringency, guiding development of appealing alternative protein products.



Dr Thomas Hazlehurst | PERFORM

DATA SCIENCE

Thomas applies machine learning and advanced analytics to predict product performance, environmental impacts and market dynamics. His background spans data modelling, acoustics and food engineering.



Dr Beth Armstrong | PEOPLE

CONSUMER BEHAVIOUR

Beth, a psychologist by training, studies consumer attitudes, trust and adoption behaviours around alternative proteins. Her insights support evidence-based communication, policy development and market strategies.



Dr Laura Diaz | PROCESS

BIOMANUFACTURING

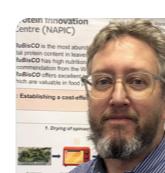
Laura has expertise in CO₂ bioconversion, bioinformatics and sequencing. She develops biomanufacturing and characterisation methods for scalable protein production.



Dr Waris Mehmood | PROCESS

PROTEIN STRUCTURE & TEXTURE

Waris brings specialist expertise in cultivated meat structuring. He works to enhance the sensory and structural qualities of alternative proteins to meet consumer expectations.



Dr Alasdair Freeman | PROCESS

BIOMANUFACTURING

Alasdair focuses on proteins with valuable techno-functional properties and develops new purification methods with improved simplicity and scalability for processing agricultural by-products.

Collaborative Programme Funding (CPF)

NAPIC's Collaborative Programme Funding leverages the UK's world-leading academic research and innovation strengths in alternative proteins to directly address industry challenges and accelerate the translation of alternative protein innovations to market (TRL 3-6). This research mode supports industry co-created projects that de-risk emerging technologies and bring alternative protein products closer to market.

NAPIC competitively awards match funding to research organisations to collaborate with industry of all sizes from micro and SME, to large multinational enterprises, as well as charities and not-for-profits. Each partnership supported will deliver a co-designed project that tackles a technical,

regulatory or market hurdle; with NAPIC allocating a total of up to £4 million, to fund CPF projects over four years to benefit the UK alternative protein ecosystem.

Delivered through six tiered funding streams, from large proof-of-concept projects to individual mobility awards, NAPIC's CPF enables a range of rapid prototyping, scale-up, techno-economic evaluation, and consumer-focused testing. This includes initiatives enhancing consumer adoption by improving the taste, acceptability, and affordability of alternative protein products and achieving nutritional equivalence with traditional proteins, as well as developing new product life assessment metrics or conducting reformulations to maximise market impact.

"The NAPIC Collaborative Programme Fund plays a vital role in bridging the gap between academic research and industrial application. By fostering partnerships that combine deep scientific expertise with real-world experience, CPF enables industry to accelerate innovation and bring sustainable, high-quality protein solutions to market faster."



Eric Weisser, Head of Open Innovation and Customer Innovation
INGREDION



CPF Round 1

In May 2025, NAPIC launched its inaugural CPF call to strong demand, as seen at Information Sessions across the UK. Following a competitive, peer-reviewed process, funding was awarded in September 2025 to 29 projects across six funding streams.

The funded portfolio was well balanced across NAPIC's pillars, focus areas, sectors, and innovation challenges, and showed excellent geographical representation across the UK among both research and non-research organisations.

£920K AWARDED BY NAPIC

£1.4M PROJECT PARTNER DIRECT AND IN-DIRECT CONTRIBUTIONS

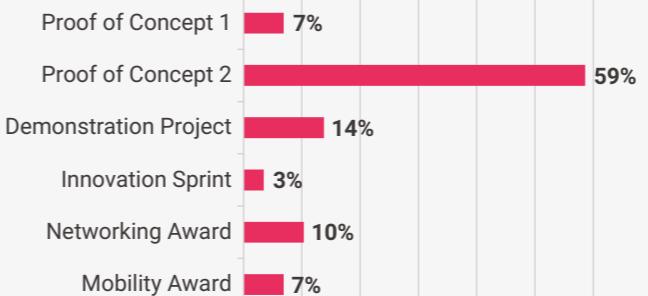
£2.6M COMBINED TOTAL PROJECT VALUE

14 UK LEAD RESEARCH ORGANISATIONS.

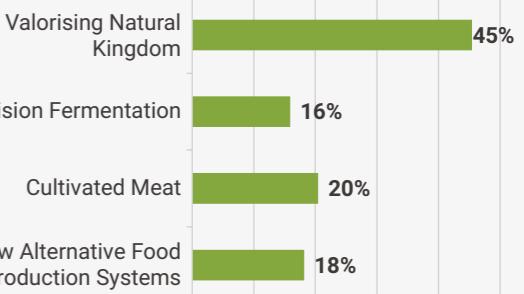
36 NON-RESEARCH PARTNERS, INCLUDING 22 SME'S, 2 REGULATORS AND 2 INTERNATIONAL RESEARCH ORGANISATIONS.

Overview of NAPIC's Funded Portfolio 2025

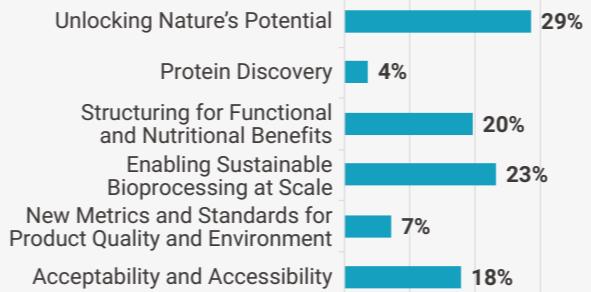
Funding Stream



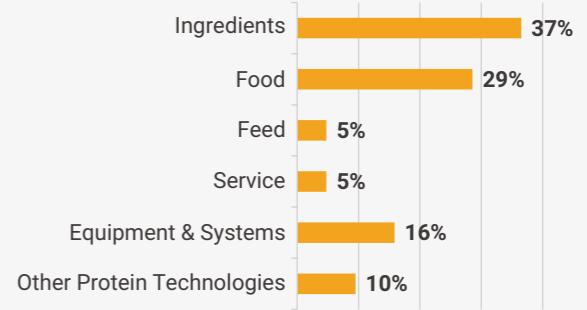
Focus Areas



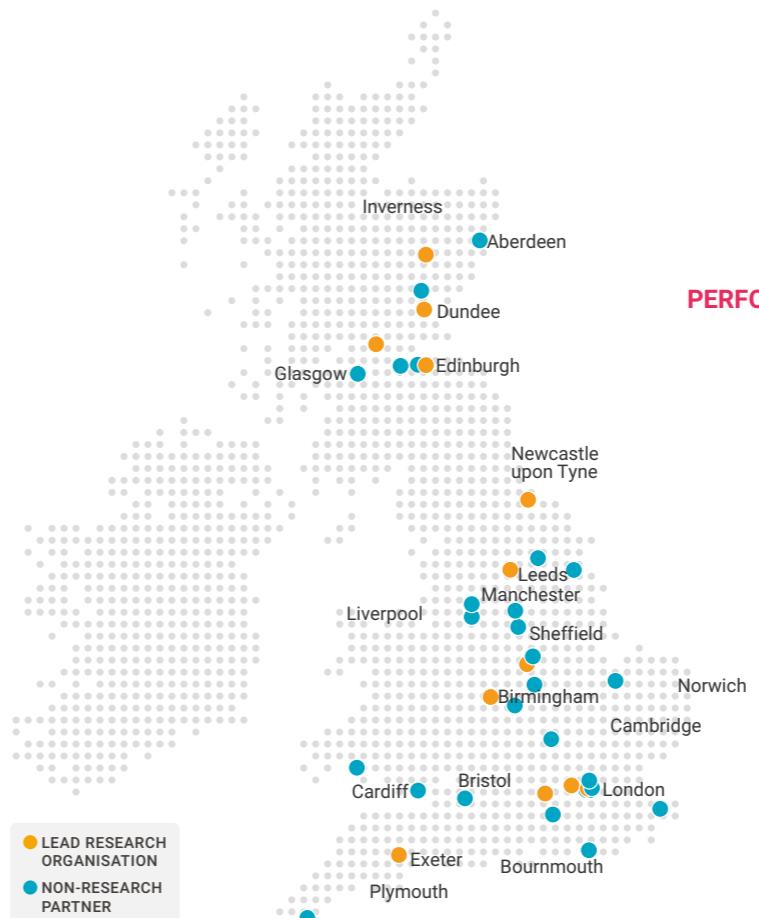
Innovation Challenges



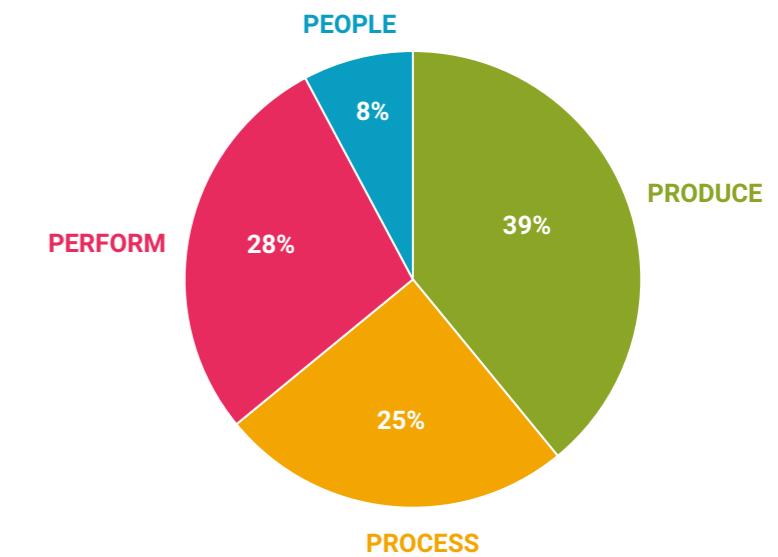
Sectors



Geographic Reach of Project Partners



Pillars



Case Study 1: PROOF OF CONCEPT

Fermentation-enhanced pulse ingredients for high-protein vegan cheese



THE GOOD PULSE Co.

UK | CHINA | MALAYSIA

Innovation Challenges



UNLOCKING NATURE'S POTENTIAL



STRUCTURING FOR FUNCTIONAL
AND NUTRITIONAL BENEFITS

Total Project Value
£99.5K

Project Duration
12 MONTHS

Pillars
**PRODUCE
PROCESS**

Focus Area
**VALORIZING
NATURAL
KINGDOM**

Alternative dairy-free cheese products are increasingly popular among vegan and plant-based consumers, yet many options are costly, nutritionally limited, and reliant on additives. This project brings together University of Nottingham researchers with plant-associated microbiota and food processing expertise, and The Good Pulse Co, a dynamic UK food-tech start-up pioneering pulse-based proteins.

This collaboration will combine UK-grown pulses with optimised bacterial cultures and fermentation processes to create a sustainable, high-protein and nutritious vegan cheese. Advanced fermentation techniques enhance texture and functional properties, while pulses boost protein and reduce saturated fat compared to existing alternatives.

"This great opportunity from NAPIC funding allows us to strengthen our collaboration with the University of Nottingham and to bring in new academic expertise, further test our technology in new ways by incorporating fermentation into the process, and focus on our next critical milestones of improving texture and taste of cheese made from our pulse-based ingredients."



César Torres, Founder & CEO
THE GOOD PULSE COMPANY



Case Study 2: PROOF OF CONCEPT

Mind the Gap: A Comparative Review of UK Policies and Public Perceptions of Cell-Cultivated and Precision Fermentation Proteins



University of
Sheffield



Food
Standards
Agency



Food
Standards
Scotland



Ipsos

Total Project Value
£91.2K

Project Duration
12 MONTHS

Innovation Challenges



ACCEPTABILITY AND
ACCESSIBILITY

Pillars
PEOPLE

Focus Area
**PRECISION
FERMENTATION,
CULTIVATED
MEAT**

Mind the Gap addresses the urgent need for UK-specific evidence on public perceptions and policy gaps for cell-cultivated and precision fermentation proteins. Scientific progress outpaces public awareness and policy development for these promising technologies for ethical and sustainable alternatives to animal-derived foods. This PEOPLE Pillar project examines consumer attitudes and policy procedures across the UK's devolved nations to support informed, trusted regulatory pathways and consumer behavioural shifts towards alternative proteins.

The project will deliver a comprehensive evidence base on policy and public perception for cell-cultivated and precision fermentation proteins, including:

"Many parts of the current food system are not sustainable, with increasing environmental challenges posing considerable threats to business as usual. Alternative proteins have the potential to offer a safe, nutritious and sustainable solution. However, ensuring public awareness, trust and confidence is essential for a successful transition. This project will examine public awareness and attitudes around cell-cultivated proteins (CCPs) and precision fermentation proteins (PFPs), and related policy across the devolved UK nations. We aim to inform ongoing regulatory and industry discussions, support the development of guidance for industry, and support public trust in novel food technologies."



Dr Beth Armstrong, Research Associate
UNIVERSITY OF SHEFFIELD



Case Study 3: MOBILITY AWARD

Advanced Interfacial Characterisation and Protein Discovery of Precision-Fermented Dairy Proteins for Sustainable Food Applications



Innovation Challenges

PROTEIN DISCOVERY

STRUCTURING FOR FUNCTIONAL AND NUTRITIONAL BENEFITS

Total Project Value
£9,000

Project Duration
4 WEEKS

Pillars
PRODUCE
PROCESS

Focus Area
PRECISION
FERMENTATION

University of Reading researchers are using engineered microbes to produce milk proteins through precision fermentation, employing a stirred-tank bioreactor system. This work aims to create sustainable alternatives to animal-derived dairy products through advanced microbial engineering and process innovation.

This NAPIC Mobility Award will enable collaboration with the University of Granada, drawing on its unique expertise and patented technology to study the properties of precision-fermented dairy proteins to investigate protein behaviour in food applications. The collaboration strengthens international research links, connecting UK and European expertise in microbial protein production and interfacial characterisation. It provides valuable opportunities for early-career researchers to access world-class analytical facilities and strengthen cross-border partnerships in sustainable food innovation.

"The consumption of dairy proteins raises sustainability and animal welfare issues. The NAPIC mobility fund will enable the investigation of the interfacial properties of casein produced via precision fermentation (PF), that will provide valuable insights to develop new sustainable dairy products from PF-produced proteins. This will be done in collaboration with the University of Granada (UGR) using OCTOPUS, a pendant drop tensiometer implemented with multisubphase exchange, designed at UGR."



Dr Fatemeh Mirpoor, Postdoctoral Research Associate
UNIVERSITY OF READING

“ ”



CPF Round 1 Full Project List

Awarded September 2025

| Project Title | Funding stream | Lead partner | Collaborating partners |
|---|--------------------|--|--|
| NutriOpt: Optimisation of novel NutriLub technology for delivering nutrients in alternative protein-rich applications | Proof of Concept 1 | University of Leeds | MicroLub Ltd |
| Developing chemical treatments to reduce astringency of pea proteins | Proof of Concept 1 | Kings College London | Ingredion |
| Smart Fermentation: In-Situ Prediction of Fungal Protein Yield and Microstructure Indicators via Ultrasonic-Optical Sensing | Proof of Concept 2 | University of Nottingham | AlgaeCytes Ltd., Biopower Technologies Ltd. |
| Cellular agriculture vs. Sustainable protein: How do people respond to different framings of alternative proteins? | Proof of Concept 2 | University of Sheffield | McDonalds UK |
| AROMAlign | Proof of Concept 2 | University of Nottingham | Umami Bioworks |
| Yami: Yeast for Yummy Plant-Based Meat Alternatives | Proof of Concept 2 | Imperial College London | Burford White Ltd T/A Shocken Foods |
| SPI-PRO: Novel functional protein ingredients from Spirulina microalgae for the food industry | Proof of Concept 2 | Queen Margaret University | ScotBio |
| Exploring gut microbiome responses to novel plant-based protein mineral delivery technologies | Proof of Concept 2 | University of Leeds | MicroLub Ltd. |
| First validation of Halophyte Protein Concentrate as a novel ingredient for salmon feeds | Proof of Concept 2 | University of Stirling | Seawater Solutions |
| Broccoli biomass side streams as feedstock for nutritious and sustainable protein - Brotein | Proof of Concept 2 | The James Hutton Institute | Upcycled Plant Power Ltd (UPP Ltd) |
| Procolate - Plant Protein fortified confectionery for a more sustainable, better-for-you snack | Proof of Concept 2 | University of Leeds | Nestlé Product Technology Center York (confectionery R&D) |
| Fermentation-enhanced Pulse Ingredients for High- protein Vegan Cheese | Proof of Concept 2 | University of Nottingham | Good Pulse Foods Ltd |
| The nutritional performance of cultivated meat: knowledge, metrics and technologies on protein quality and digestibility | Proof of Concept 2 | University of Sheffield | Cellular Agriculture Ltd |
| Bridging Tradition and Innovation: Rhizopus-Based Fermentation for Sustainable Protein Supply | Proof of Concept 2 | Imperial College London | Plant Meat Ltd (trading as THIS) |
| Sustainably Grown Mushrooms: A Circular Resilient Solution for Nutrition Security and Climate Change (MYCO-SECURE) | Proof of Concept 2 | The Rowett Institute, University of Aberdeen | Rhyze Mushrooms co-op CIC, Pictish Worms Ltd., Askew & Barrett (Pulses) Ltd., Hemp it Up |

| | | | |
|---|--------------------|-----------------------------|---|
| Fast Fat: accelerating adipogenesis for cultivated meat manufacture | Proof of Concept 2 | University of Sheffield | SilViA Bio |
| Optimising downstream processing to boost fungal mycelium protein quality | Proof of Concept 2 | University of Nottingham | Adamo Foods |
| Mind the gap: A comparative review of UK policies and public perceptions of cell-cultivated and precision fermentation proteins | Proof of Concept 2 | University of Sheffield | Food Standards Agency (England and Wales), Food Standards Scotland, IPSOS |
| Next-Generation Wheat: Nutritional Enhancement via Solid-State Fermentation | Proof of Concept 2 | University of Sheffield | Fibre Folks Ltd |
| AlgaFlow: a novel approach for land-cultivation of high protein green seaweeds | Demonstration | University of Exeter | The Cornish Seaweed Company |
| Plant-based egg-alternatives for food manufacturers | Demonstration | University of Leeds | OGGS (Alternative Foods London Ltd) |
| A biofidelic test method for characterization of alternative proteins | Demonstration | University of Sheffield | New Food Innovation Ltd |
| Towards Sustainable Commercial Production of Sweet Proteins: Precision Fermentation Optimisation in a Rotating Spiral Bioreactor | Demonstration | University of Sheffield | MadeSweetly (UBLII LTD) |
| Nutritional optimisation of juvenile Black Soldier Fly (<i>Hermetia Illucens</i>) Larvae | Innovation Sprint | University of Nottingham | Fairman Knight & Sons Ltd |
| Understanding Chef trainees and educators' knowledge and attitudes towards alternative proteins | Networking Award | Brunel University of London | Flourish Food Science (a brand of Altmore Enterprise Ltd) |
| Networking Event on Small Angle Scattering for Alternative Protein Innovations (SAS-API) | Networking Award | University of Leeds | MicroLub, Oatly Ltd, LS Instruments |
| Cultivating interdisciplinarity: a co-creative approach to cellular agriculture educational resources | Networking Award | Aston University | Cell Ag UK, GFI |
| Advanced Interfacial Characterisation and Protein Discovery of Precision-Fermented Dairy Proteins for Sustainable Food Applications | Mobility Award | University of Reading | University of Granada |
| Development of a Purification and Quantification Method for a Novel Lanthipeptide from Engineered Bacteria | Mobility Award | Teesside University | Beijing Technology and Business University |



Activity Stream 2: National Knowledge Base

The alternative protein sector is characterised by a wide diversity of feedstocks and technologies, yet progress is often constrained by regulatory frameworks that have not kept pace with innovation or consumer demand. NAPIC was established to help harmonise this landscape, creating an open innovation ecosystem where knowledge is shared, challenges are addressed collectively, and standardisation can emerge.

Our vision for a National Knowledge Base is built on two core pillars: people and data. NAPIC brings together industry, academia and policymakers through a dedicated programme of engagement, providing a platform to identify bottlenecks, address barriers and accelerate innovation. This collective insight enables NAPIC to support emerging companies, inform policy development and champion UK innovation internationally.

In parallel, NAPIC is developing a centralised, one-stop repository of the community's collective intelligence, including publications, datasets and position papers. By enabling responsible data sharing and building consumer trust, this resource streamlines routes to market and helps reduce development risk across the alternative protein sector.

NAPIC Spin-out Spotlight – MicroLub Ltd

MicroLub Ltd, a deep-tech spinout from the University of Leeds and a NAPIC partner, recently secured £3.5M in seed investment led by Northern Gritstone. As one of the most promising UK alternative protein innovations, MicroLub has also secured two NAPIC CPF grants to accelerate its platform.



David Peters
CEO, MICROLUB LTD



Dr. Andrea Araiza-Calahorra
TECHNICAL DIRECTOR,
MICROLUB LTD



Dr. Andrew Naylor
INVESTMENT
DIRECTOR, NORTHERN
GRITSTONE



Professor Anwesha Sarkar
FOUNDER,
MICROLUB LTD



What problem is MicroLub solving in the alternative protein sector?

"MicroLub is tackling one of the biggest sensory hurdles in alternative proteins: replicating the taste, texture,

and mouthfeel of fat-rich foods—without the calories or environmental cost. Sensory hurdles remain the top barriers to repeat purchase in the alternative protein sector - more so than price. By solving the sensory problem, MicroLub's platform technology helps food manufacturers create products that consumers perceive as indulgent and satisfying. In addition, the clean-label solutions enable food companies to remove emulsifiers and gums from their products, aligning with the growing consumer demand for simpler ingredient lists."

David Peters
CEO, MICROLUB LTD

What's the science behind MicroLub?

"We design protein–biopolymer architectures that create ultra-low friction without oils or additives. Our self-assembled plant protein hydrogels form hydration layers that enhance smoothness and creaminess, while also enabling delivery of key micronutrients. It's a drop-in solution that transforms mouthfeel naturally - a real game-changer for sustainable, great-tasting foods."

Dr. Andrea Araiza-Calahorra
TECHNICAL DIRECTOR, MICROLUB LTD

Why did Northern Gritstone invest?

"We assess the team, the technology, and the total addressable market—and MicroLub excelled in all three. The technology is genuinely unique, the team is exceptional, and the potential to impact multibillion-dollar markets made this a compelling investment."

Dr. Andrew Naylor
INVESTMENT DIRECTOR, NORTHERN
GRITSTONE

How has MicroLub grown post-investment?

"MicroLub received a favourable response from investors when raising money for our seed investment. We have already completed several collaboration projects with multinational food CPG companies and food ingredients companies and are working with a number of partners to commercialise our technology across multiple categories.

We have created 9 full-time jobs in Leeds, as well as several part-time roles, and are continuing to add talent to both our technical and commercial teams. A recent highlight was exhibiting at the inaugural NAPIC conference, which generated both great feedback and significant business leads."

David Peters
CEO, MICROLUB LTD

How has NAPIC supported your innovation pipeline?

"NAPIC has been pivotal in strengthening our innovation pipeline by providing strategic alignment, resources, and validation for our technologies. With NAPIC's help our team has developed a new platform that leverages plant proteins to deliver nutrients efficiently while enhancing lubrication, an important step forward for alternative protein innovation. Our CPF projects supported by NAPIC allow us to test nutrient delivery, explore different plant proteins, optimise manufacturing, and evaluate microbiome effects using the MiGut Model. NAPIC is accelerating our transition from discovery to real-world innovation."

Dr. Andrea Araiza-Calahorra
TECHNICAL DIRECTOR, MICROLUB LTD

What does 'profit with purpose' mean for MicroLub's impact?

"We invest in companies that deliver global impact aligned with the UN Sustainable Development Goals—MicroLub contributes to both health and climate action. We also focus on high-skill job creation across the North, and MicroLub is already delivering on that."

Dr. Andrew Naylor
INVESTMENT DIRECTOR, NORTHERN
GRITSTONE

What does the next 5 years look like for MicroLub?

"The next five years promise to be a very exciting time for us, as we transition from university spinout to science-led, large-scale ingredients solutions company. NAPIC will be essential in helping us overcome manufacturing, regulatory, and partnership challenges. The growth opportunities are huge—our focus is on scaling where we add the most value."

David Peters
CEO, MICROLUB LTD

What does MicroLub need from NAPIC to reach its ambition?

"NAPIC gives us unparalleled access to the UK alternative protein ecosystem—customers, suppliers, regulatory experts, and technical collaborators. Its national knowledge base and open-access protein functionality data will be invaluable for formulation and scale-up. NAPIC is key to helping us move fast and de-risk innovation."

Dr. Andrea Araiza-Calahorra
TECHNICAL DIRECTOR, MICROLUB LTD

How can NAPIC catalyse the next generation of investible spinouts?

"NAPIC can foster a culture of IP awareness, support researchers through training, and connect them with mentors and investors. By giving founders time and tools to pursue commercialisation, NAPIC can help turn world-class science into high-impact, investible companies."

Dr. Andrew Naylor
INVESTMENT DIRECTOR, NORTHERN
GRITSTONE

NAPIC Spin-out Spotlight – ReNewFood Ltd

ReNewFood Ltd is a biotechnology spinout from the University of Sheffield that has successfully progressed through the University's Commercialisation Journey, a stage-gated programme designed to support academic entrepreneurs. The company has since been selected for the highly prestigious accelerator programmes run by Northern Gritstone and Big Ideas Ventures.



Matthew Hutchinson
CEO, RENEWFOOD LTD

Dr. Kang Lan Tee
ACADEMIC
CO-FOUNDER,
RENEWFOOD LTD

**Dr. Fer Velazquez
de la Paz**
TECH TRANSFER
OFFICER, UNIVERSITY
OF SHEFFIELD

**Professor Tuck
Seng Wong**
CO-FOUNDER,
RENEWFOOD LTD



What problem is ReNewFood solving in the alternative protein sector?

"Taste is king – it's what keeps consumers coming back. Our mission is to enable food and drink innovation that doesn't compromise on taste. For alternative proteins, off-notes like 'beany' or 'bitter' remain a major barrier. Our primary focus is on our sugar reduction technology, but we are looking to support many subsectors within the food industry, including alternative proteins. With ReNewFood's protein-based flavourings, we can make alternative protein products nutritious, sustainable, and genuinely delicious."

Matthew Hutchinson
CEO, RENEWFOOD

What is the science behind ReNewFood?

"Our technology harnesses naturally occurring flavour-active proteins – from sweetness to umami to bitterness-masking. Yet, this vast potential remains largely untapped. At ReNewFood, we combine our expertise in protein engineering to discover these flavour-active molecules with our bioprocess engineering capabilities to develop sustainable manufacturing processes. Using protein engineering and precision fermentation, we discover and sustainably produce these next-generation flavour ingredients at scale."

Dr. Kang Lan Tee
ACADEMIC CO-FOUNDER, RENEWFOOD

Why did the University of Sheffield back the spinout?

"ReNewFood progressed strongly through our Commercialisation Journey process, with strong market data and meaningful customer validation gathered during the BBSRC IUK iCURE programme. Very few startups are developing protein-based flavour ingredients, and the team demonstrated both innovation and clear customer validation. They are well positioned to lead this emerging market."

Dr. Fer Velazquez de la Paz
TECH TRANSFER OFFICER, UNIVERSITY
OF SHEFFIELD

How has the journey been since raising investment?

"We're still early in our journey, but we've made major advances in our sweet protein portfolio through international collaboration. Our new Sheffield lab keeps us embedded in the region's fast-growing biotech and food-tech ecosystem."

Matthew Hutchinson
CEO, RENEWFOOD

Why were you selected by Northern Gritstone and Big Idea Ventures?

"ReNewFood excels in Total Addressable Market, and Technology. The leadership is strong, the market opportunity is vast - taste underpins every food product. ReNewFood's technology is truly innovative, centred on protein-based flavour ingredients such as sweet proteins, which can deliver sweetness without calories. The enormous potential for impact is recognised by flavour houses around the world, and these strengths undoubtedly contributed to ReNewFood's success in securing places on two highly prestigious accelerator programmes."

Dr. Fer Velazquez de la Paz
TECH TRANSFER OFFICER, UNIVERSITY
OF SHEFFIELD

What does the next 5 years look like?

"Our goal is to launch our first products and scale our sweet protein platform. We'll expand our team, pursue strategic partnerships, and accelerate our pathway to market. The NAPIC network will be key in connecting us to collaborators and commercial partners."

Matthew Hutchinson
CEO, RENEWFOOD

What advice would you give to academic co-founders?

"Balancing academia and commercialisation is challenging but hugely rewarding. Build a strong team with technical and commercial expertise. Universities must continue evolving how they recognise and support entrepreneurial academics, as not all innovation can be published."

Dr. Kang Lan Tee
ACADEMIC CO-FOUNDER, RENEWFOOD

How can NAPIC help you realise your ambition?

"NAPIC can support us by connecting spinouts, offering IP and entrepreneurship training, and providing funding opportunities to explore new directions. With funding harder to secure than ever, NAPIC's support is both timely and vital."

Matthew Hutchinson
CEO, RENEWFOOD

What can NAPIC do to catalyse the next generation of spinouts?

"NAPIC can help advance transformative technologies and ensure the UK remains globally competitive. The problem-solving and customer-facing nature of NAPIC will consolidate opportunities that connect innovators with customers and investors – not only within the UK but also globally – to ensure that promising technologies can access the capital and partnerships needed to scale. By supporting team-building, IP translation, and customer connections, NAPIC can bridge innovators with investors and partners – catalysing the next wave of investible, high-impact spinouts."

Dr. Fer Velazquez de la Paz
TECH TRANSFER OFFICER, UNIVERSITY
OF SHEFFIELD

International Engagement

Since its inception, NAPIC has focused on building international bridges between science, industry, and policy, promoting knowledge exchange and collaboration to accelerate the development of alternative proteins globally. Through new research networks, strategic partnerships, and international engagement, NAPIC is supporting academic and industrial communities to drive innovation and strengthen global food resilience.

International Scientific Engagement Board (ISEB)

To underpin its global ambition, NAPIC established the International Scientific Engagement Board (ISEB) as a core governance mechanism. Representing 14 global food innovation hubs across Denmark, New Zealand, Mexico, Spain, the Netherlands, Israel, Canada, Ireland, South Africa, the USA, Singapore and Sweden, and formalised through a Memorandum of Understanding (MoU), the ISEB supports NAPIC's global strategy by fostering collaboration, strengthening partnerships, and facilitating knowledge exchange.

Convening this board places NAPIC at the heart of a wider international community dedicated to advancing sustainable protein production and utilisation, signalling the UK's intent to position itself as a global leader in the field.

"This partnership with NAPIC is a unique opportunity to foster high-impact research and accelerate the translation of scientific knowledge into real-world food solutions. It reinforces CSIC's commitment to international collaboration and aligns with our shared goal of advancing alternative proteins that are not only sustainable but also nutritionally meaningful and accessible worldwide."



Dr. Cristina Martínez Villaluenga
CHAIR OF THE ISEB AND CSIC RESEARCH SCIENTIST, SPAIN



- 1 PROTEIN INDUSTRIES CANADA Protein Industries Canada CANADA
- 2 ILSI GLOBAL International Life Sciences Institute USA
- 3 UCD University College Dublin IRELAND
- 4 CSIC Consejo Superior de Investigaciones Científicas SPAIN
- 5 WAGENINGEN UNIVERSITY & RESEARCH Wageningen University NETHERLANDS
- 6 AARHUS UNIVERSITY Aarhus University DENMARK
- 7 Technion R&D Foundation Ltd ISRAEL
- 8 University of Pretoria SOUTH AFRICA
- 9 MASSEY UNIVERSITY TE KUNINGA KI PUKEHOROA Massey University of New Zealand NEW ZEALAND
- 10 CIATEJ CIATEJ MEXICO
- 11 Tecnológico de Monterrey Monterrey Institute of Technology and Higher Education MEXICO
- 12 NUS National University of Singapore SINGAPORE
- 13 KTH Kungliga Tekniska högskolan (KTH) Food SWEDEN
- 14 CICY Ciencia y Tecnología (CICY) MEXICO



Dr. Alan Javier Hernández-Álvarez, ISEB Champion

UNIVERSITY OF LEEDS

Dr. Hernández-Álvarez represented NAPIC at the Institutional Mission Spain–United Kingdom 2025: Immersion Visit on Scientific and Regulatory Innovation in the Agri-Food Sector, hosted by the Bezos Centre for Sustainable Protein. This mission brought together representatives from the Spanish Government and leading universities, providing a platform to showcase NAPIC's scientific capability, infrastructure, and commitment to global collaboration.

In October 2025, Alan represented NAPIC at the Foro Tecnológico: Plant-based Protein Innovations 2025 in Guadalajara, Mexico, co-organised with CIATEJ and Tecnológico de Monterrey. His presentation highlighted NAPIC's pioneering work in plant protein science, with emphasis on improving protein quality, functionality, and nutritional performance through novel processing.



In October, NAPIC was also represented at Global Food Week in Abu Dhabi, where its Operations Director, Dr Andrew Lee, delivered an invited talk on plant-protein texture as part of the AgriTech Forum and contributed to a panel discussion on the role that entities such as NAPIC can play in supporting the development and harmonisation of alternative protein regulations and standards, as part of the Proteins Alternative (PALT) stream hosted by the Abu Dhabi Investment Office (ADIO).



Dr. Kang Lan Tee, Deputy ISEB Champion
UNIVERSITY OF SHEFFIELD

Elsewhere, Dr. Kang Lan Tee presented NAPIC's mission and activities at major international events, including:

- Synthetic Biology & Precision Fermentation: Accelerating Biotech Innovation at the National Science and Technology Fair 2025, Bangkok, Thailand.
- Future Food Congress 2025, Singapore.

International Dialogue and Early Outputs

At NAPIC's Inaugural Conference in Sheffield, the ISEB hosted a dialogue session with participants from Mexico, Canada, and Australia. Delegates praised the conference for its unique focus on alternative proteins and expressed strong interest in future collaboration, highlighting NAPIC's role as a facilitator and matchmaker for interdisciplinary research.

Early international outputs are already materialising, with two successful CPF Mobility Awards:

- Teesside University with Beijing Technology and Business University
- University of Reading with the University of Granada

Policy Engagement

Cell-Cultivated Products (CCP) Sandbox

Launched in 2025, the CCP Sandbox Programme—funded by the Department of Science, Innovation and Technology's Engineering Biology Sandbox Fund—aims to ensure CCPs are developed safely while supporting sector innovation. The two-year programme brings together scientists and regulatory experts from academia, industry, and trade organisations to generate the evidence required by the FSA and FSS to shape future CCP regulations.

NAPIC Co-Directors Professor Karen Polizzi and Professor Derek Stewart, along with NAPIC partners Hoxton Farms and Roslin Technologies, continue to play a central role in this pioneering regulatory initiative.

Workshops held to date have covered hygiene, production, nutrition, allergenicity, labelling, toxicology, and broader regulatory considerations. These sessions have enabled cross-sector discussions to drill down into the specific technical factors influencing CCP development and safety.

Future phases will explore solutions to the identified issues and outline the roadmap towards a new regulatory pathway. The FSA remains committed to completing the full safety assessment of two CCPs within the next two years.

For NAPIC, this programme provides a unique opportunity to support evidence-based regulation and to integrate insights emerging from its Collaborative Programme Funding Portfolio.

The National Protein Roadmap

The Organisation for Economic Co-operation and Development and Food and Agriculture Organizations Agricultural Outlook 2025–2034, indicates that global protein demand continues to rise, driven by population and economic growth. Without diversification into alternative protein sources, per-capita and total meat consumption may increase by 12% and 63% respectively by 2050, with corresponding increases in greenhouse gas emissions (GHG). Livestock production already accounts for 12% of global GHG emissions.

In the UK, the food system contributes an estimated 38% of national emissions, with animal agriculture a major driver. In response, NAPIC is developing a National Protein Roadmap to support the UK's ambition to reach net zero by 2050. The roadmap will identify current protein supply and demand, future needs, and the initiatives required to support sustainable growth.

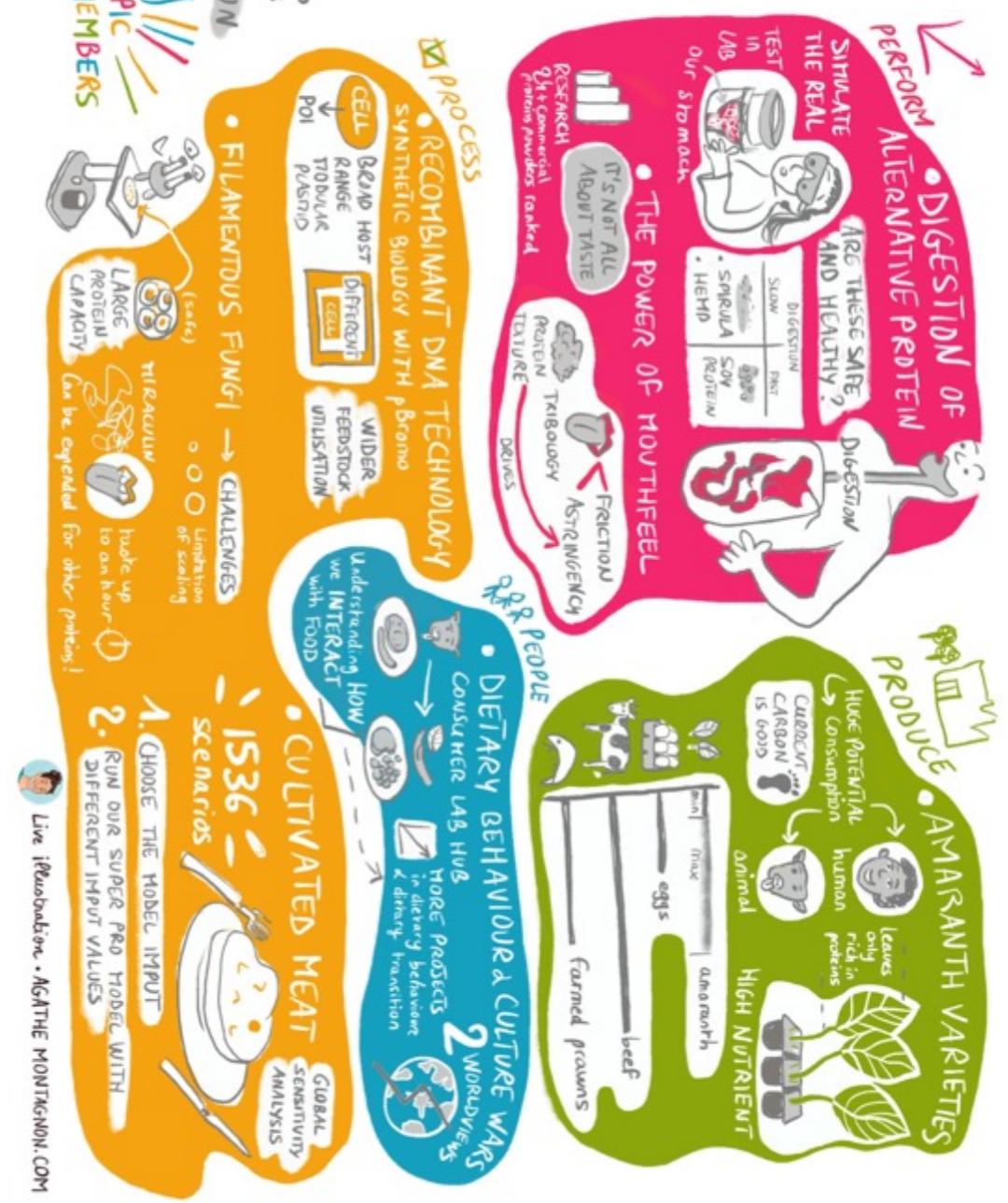
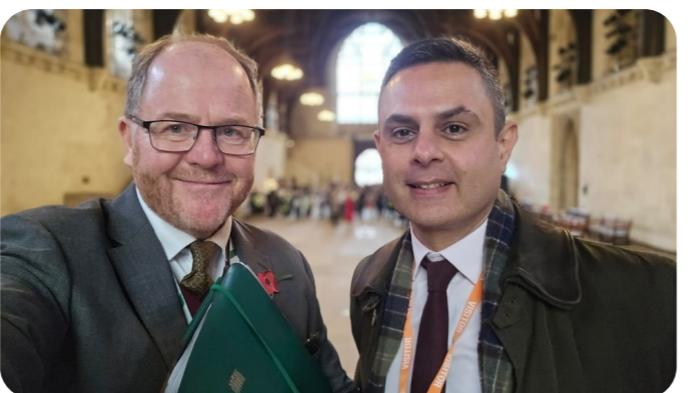
Preliminary analysis of global and regional protein strategies has already highlighted key themes: increasing domestic protein production, reducing reliance on imports, embedding circular economy principles, strengthening regulatory frameworks, and recognising protein as part of the national bioeconomy.

NAPIC is now engaging stakeholders across the food supply chain—industry, academia, regulators, and government—to shape the roadmap. Ongoing work includes building a baseline for UK protein intake, demand, and supply, and modelling future scenarios incorporating factors such as trade and climate change.

NAPIC contributes to the Global Food Security Inquiry at the House of Commons

NAPIC was honoured to be invited to the House of Commons to support the UK Parliament's Global Food Security Inquiry which provided a significant opportunity to highlight the role that alternative proteins can play in addressing some of the most pressing challenges facing the national and global food system.

Representing NAPIC, CEO Imran Afzal delivered oral evidence to the Committee, outlining current regulatory barriers that hinder innovation and setting out clear recommendations to help accelerate the safe and responsible development of next-generation food technologies. His contribution provided valuable insight for policymakers examining the future of UK food security.



NAPIC Inaugural Conference

In September 2025, NAPIC marked its first year with its inaugural conference at the University of Sheffield. The two-day event welcomed more than 350 delegates from academia, industry, government, the third sector, investors, and international partners.

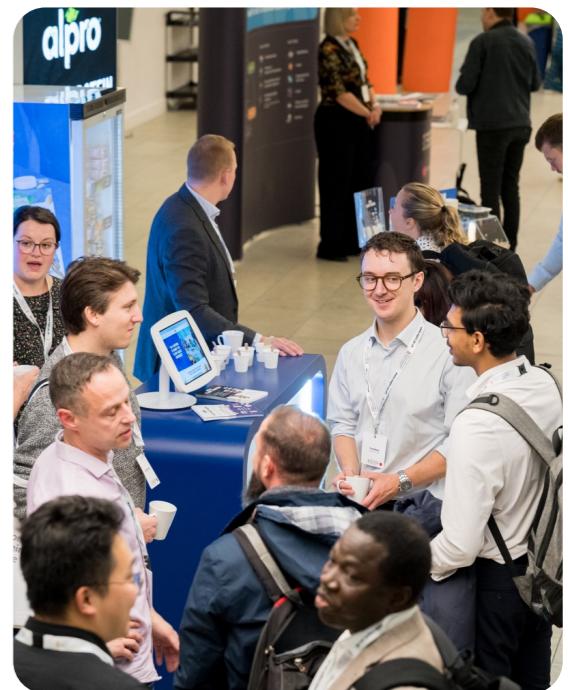


Creating a vibrant platform for alternative protein research and collaboration. The programme spanned NAPIC's four pillars—PERFORM, PRODUCE, PROCESS, and PEOPLE—and included keynotes from Bruce Friedrich GFI (President), and Professor Robin May FSA (Chief Scientific Advisor).

Highlights included:

- **Fireside Chat: "Discovery to Innovation to Commercialisation in alternative proteins"**
Hosted by Professor Anwesha Sarkar, with contributions from Dr Andrea Araiza Calahorra, Professor Tuck Seng Wong, Coco Hollamby, and Andrew Iye.
- **Fireside Chat: "Feedstock Insights"**
Hosted by Professor Derek Stewart, featuring Declan Ferguson (Finnebrogue) and Trisha Toop (Upp).
- **Alternative Protein Nibbles & Networking**
Hosted by Oatly, Algenuity, MicroLub Ltd, Quorn, Ferm IQ, Lupin Loop Project and Hendersons.

The conference was well received by delegates, with 89% reporting that they were satisfied or very satisfied with their experience.



POSTER AWARDS (SPONSORED BY ALPRO)

1. Pourable sugar-fat icings – Peter Cooper, University of Sheffield
2. Evaluating the Sustainability of Vertical Farm Grown Amaranth as a Protein Rich Crop– Frances Sandison et al., James Hutton Institute
3. Strategies to Increase Acceptance of Pulses in Meat-Eaters – Nicola Buckland et al., University of Sheffield

The event strengthened national and international networks, reinforced awareness of the drivers of protein transition, identified new collaborative research priorities, and enhanced engagement between early-career researchers and SMEs.

"NAPIC 2025 captured what makes this community unique – collaboration, creativity, and a shared commitment to transforming how we produce and consume protein. It was inspiring to see such a diverse group of people come together with a common purpose."



Professor Louise Dye
NAPIC CO-DIRECTOR AND
CONFERENCE LEAD

Outreach & Engagement

This year, NAPIC expanded its outreach across industry, public audiences, and the creative sector—strengthening national understanding of alternative proteins and showcasing the importance of UK research.

Public Engagement

NAPIC brought science directly to the public through a series of interactive events.

National Science and Media Museum – The Future of Food

During a weekend of hands-on demonstrations, NAPIC researchers introduced visitors to rheology and tribology—showing how food flows and interacts in the mouth, and why these factors matter for enjoyable, sustainable products.

Pint of Science – The Hidden Beauty of Food

NAPIC contributed to an exhibition revealing the unseen world of food science—from microscopic textures to plant-based innovations.



Industry Leadership

NAPIC has been represented at nearly 100 conferences and events, including one of the sector's flagship global conferences Future Food-Tech. Here, NAPIC Co-Director Professor Anwesha Sarkar joined a panel on scaling alternative protein production, highlighting innovations to reduce manufacturing costs while maintaining taste and texture—key drivers of consumer adoption.



Creative collaboration

In partnership with Compass Live Art and the University of Leeds, NAPIC co-hosted a two-day artist-researcher residency exploring how alternative proteins move from lab to market. The workshop fostered creative dialogue on communicating the future of sustainable food to the public.



NAPIC R&I Fellow Recognised: Tribology Bronze Award

NAPIC is proud to celebrate Dr Ben Kew, Research & Innovation Fellow, who has been awarded the IMechE Tribology Bronze Medal by the Institution of Mechanical Engineers — a prestigious honour recognising outstanding early-career contributions to tribology. Ben attended the award ceremony, marking a proud moment for him, for NAPIC, and for the future of sustainable food science.

"I am deeply honoured to receive this prestigious medal... It is truly remarkable to be recognised not only from the field of food science, but also for my work in oral tribology... I'm optimistic that this recognition will elevate the field's visibility and improve the prospects for future funding."



Dr Ben Kew
NAPIC R&I FELLOW

This is a landmark achievement — the first time in the medal's 50-year history that it has been awarded to a food scientist. Ben's pioneering research in oral tribology for alternative proteins studying how food structure,

friction and lubrication shape mouthfeel and sensory perception is directly supporting NAPIC's mission to advance innovation in sustainable, plant-based foods.





Activity Stream 3: Workforce for the Future

Delivering NAPIC's vision of making alternative proteins mainstream will require a step-change in workforce capability. Industry workshops in January and November 2024 highlighted a shortage of staff with the interdisciplinary expertise needed to drive innovation—from protein discovery to bioprocess scale-up—and a need to embed big data and digital tools across the sector. Alongside technical expertise, industry partners also stressed the need for entrepreneurial talent capable of founding new ventures and building a high-value, UK-based alternative protein Bio-Valley.

This evidence underpins NAPIC's strategy: to strengthen the UK's scientific base while training the academic, industrial, and entrepreneurial leaders who will shape the next generation of alternative protein innovation.

NAPIC is delivering this through a multi-pronged approach:

- Technical and leadership development for Research & Innovation Fellows, PhD students and Technicians
- A two-stage entrepreneurial programme and accelerator
- A pipeline of short CPD courses to upskill the wider workforce.

Together, these initiatives create an end-to-end training pathway spanning discovery to commercialisation, supported by NAPIC's network of expert partners.



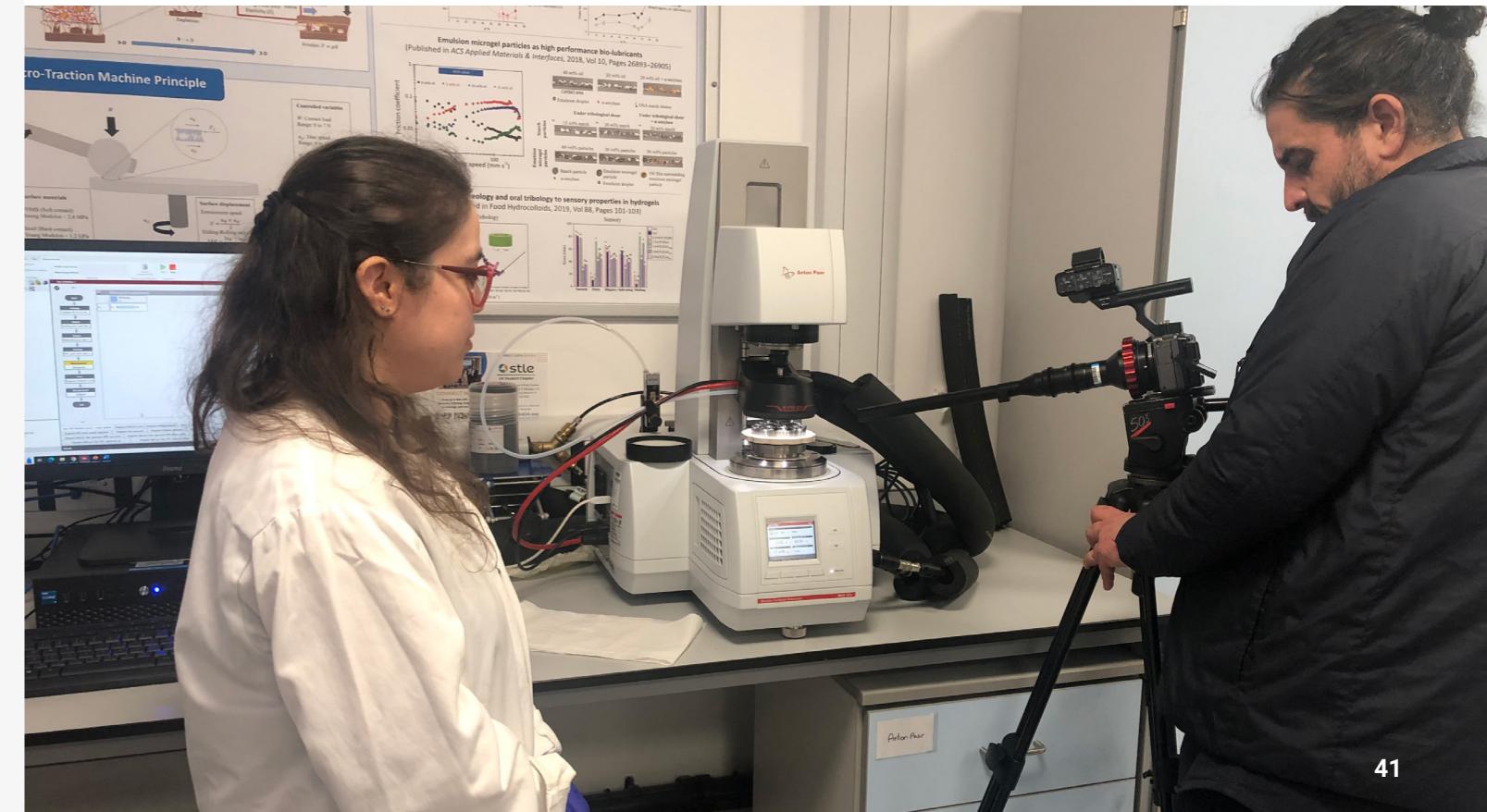
Media Training for Future Leaders

To strengthen communication skills across the community, GFI delivered a science communication and media training workshop for NAPIC researchers. The session covered misinformation in the protein space, preparing for interviews, message development, and practical broadcast simulations.

"The session gave me the tools and confidence to talk about my research clearly, even to audiences who may be sceptical about alternative proteins."



Taskeen Niaz
R&I FELLOW



This training is critical for NAPIC due to the high media attention of this rapidly evolving area. Since launching, NAPIC has received 140 media mentions across international publications, national news, radio, and television. Our researchers have engaged widely with the media for example, appearing on BBC Radio 4's Sliced Bread, Channel 4's Meal Deals: Behind the Bargains, Sky News, and The Independent, helping to bring trusted scientific insight to public conversations on alternative proteins and the future of food.

Protecting Protein Innovation: IP Training for Early-Career Researchers

In October 2025, NAPIC convened the first joint Intellectual Property workshop in conjunction with CARMA, the Bezos Centre for Sustainable Protein, and the Microbial Food Hub following the signing of a sector-wide MoU. Over 60 participants took part in sessions led by Northern Gritstone, HGF, and Potter Clarkson covering patentability, commercialisation pathways, and investor perspectives. Real-world case studies helped bridge the gap between academic discovery and commercial opportunity.

The workshop strengthened collaboration across eight universities and marks the first step in a coordinated programme of joint skills initiatives planned for 2026 and beyond.



NAPIC's Portfolio of Short Training Courses

As part of its long-term sustainability strategy, NAPIC has launched a commercial portfolio of short training courses to meet industry demand for practical skills and generate new revenue streams. The first course—Application of Mouthfeel Assessment—launched in September 2025, and will run for the first time in May 2026. This course will equip professionals with theoretical and hands-on training in rheology, tribology and analytical tools such as QCM-D to support product development and sensory optimisation.

NAPIC's market research has found evidence of high demand for a variety of short courses, with NAPIC planning to respond to this with new short courses being launched annually. These will include life-cycle assessment, AI applications, and extrusion technology to support translation from lab processes to industrial manufacturing.

SEED: NAPIC's Entrepreneurial Programme

Applications for NAPIC's Sustainable Entrepreneurship for Emerging Diets (SEED) programme opened in November 2025 targeted at its Research Fellows, PhD Students and Technicians. The three-month entrepreneurial training initiative, which will begin in March 2026, will develop participants' skills in opportunity identification, business modelling and commercial strategy through a series of expert-led workshops, mentoring and a final investor pitch day. Delivered with partners including Tate & Lyle, Pladis, Calysta, Northern Gritstone and Yildiz Holdings; SEED forms the first step in NAPIC's broader commercialisation pathway and complements accelerator programmes such as ICURe.

“It’s wonderful to see NAPIC leading the way in the alternative protein space vital for the transformations that we need to create in the health of both people and our planet – building both the science and the skilled scientists for tomorrow. NAPIC’s SEED programme will enable and empower our future generation of leaders to turn innovative concepts in alternative proteins into real-world solutions, creating the world leading ventures of tomorrow, today.”

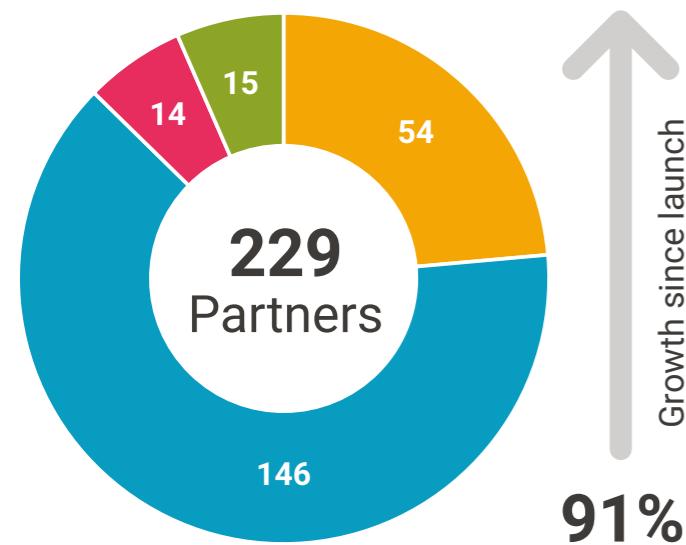
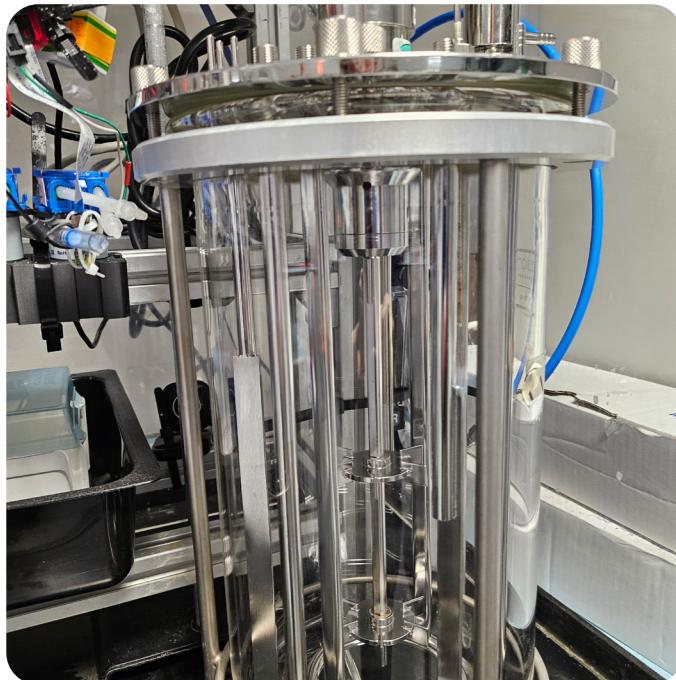


Dr Ian Noble, VP R&D
R&D VP, MONDELEZ
INTERNATIONAL



Activity Stream 4: Access to Innovation Facilities

Scaling early-stage innovation into commercially viable products remains a major challenge for the alternative protein sector. Although the UK hosts strong research activity, many promising technologies struggle to progress due to limited access to pilot- and demonstration-scale facilities. During NAPIC's co-creation workshops, partners repeatedly highlighted this lack of accessible infrastructure as a key bottleneck, particularly for SMEs. Validating processes at scale, ensuring product consistency, meeting regulatory expectations, and generating robust performance data are essential for investment and commercial uptake. Overcoming this "valley of death" will require coordinated infrastructure access and shared investment in scale-up resources.



An Open Innovation Ecosystem

NAPIC welcomes partners across the value chain, from academia and industry to regulators and policymakers. A partner is any organisation contributing to NAPIC's mission through strategic input, project collaboration, governance participation, or wider support. This open innovation community is built around shared values of collaboration, data exchange and knowledge transfer.

Since launch, partner numbers have grown by 91% to 229 organisations. To explore the benefits of joining our ecosystem contact us at info@napic.ac.uk.

- INTERNATIONAL NON-RESEARCH ORGANISATIONS
- INTERNATIONAL RESEARCH ORGANISATIONS
- UK RESEARCH ORGANISATIONS
- UK NON-RESEARCH ORGANISATIONS

NAPIC Partners Say...



FOOD STANDARDS AGENCY

"At the Food Standards Agency, we are excited to be a partner in NAPIC. As a food regulator, our role is to ensure that alternative proteins are safe for consumers to eat but do so in a way that supports innovation, choice and other societal benefits. We see NAPIC as an important means to help us achieve that."



WHITWORTHS

"Whitworths is dedicated to improving the nation's health by promoting nuts, seeds, and dried fruit. As a leading UK food business, we advocate for better nutrition and are excited to join NAPIC and together innovate in alternative proteins, offering minimally processed, natural, meat-free solutions—using nuts to support healthier diets and environmental sustainability."



BIOCHROM

"BioChrom is excited to join NAPIC and contribute to the advancement of research into alternative proteins. By leveraging our expertise in amino acid analysis, we aim to support innovative solutions for sustainable food production. This collaboration will drive progress in understanding alternative protein sources, fostering healthier, more sustainable diets, and contributing to the future of food technology."



PACKAGED FEEDS

"Packaged Feeds are excited to join NAPIC and collaborate in developing innovative solutions in alternative proteins. We are on a mission to revolutionise the UK food manufacturing and waste management industries by transforming 100% of edible food co-products into sustainable products. Our pioneering approach leverages natural processes and advanced bio-conversion techniques, including the use of Black Soldier Fly (BSF) technology, to turn food surplus into high-value insect protein, oil, and frass. These sustainable by-products improve the economics of recycling while reducing environmental impact."



THE GOOD PULSE COMPANY

"We are a science-led company developing functional and minimally processed ingredient blends from pulses and other seeds, enhanced by unique physical processing technologies to make it easier and cheaper for food companies to produce more nutritious, tastier, affordable plant-based dairy alternatives to satisfy consumer needs. We are delighted to join a network of innovators working on creating alternative protein technologies to develop new products and processes."



MODEL A

"We are happy to engage with NAPIC and collaborate in developing innovative solutions in alternative proteins. Modela aims to enhance the traditional engineering process design and supervision by implementing virtual prototypes based on advanced mathematical models. By the simulation of actual systems, we can assist the process industry in reducing risks, lowering costs, and optimising performance."



PLANEATRY ALLIANCE

"At Planeatry Alliance, we're laser focused on bridging health and sustainability to improve the food system. Joining NAPIC as a strategic partner is an exciting next step in our mission to drive meaningful change across the value chain. Together, we'll work with NAPIC to go faster and further on translating science into implementation for the benefit of people and planet."



UMAMI BIOWORKS

"At Umami Bioworks, our focus is on cultivated seafood. We are thrilled to join NAPIC as industrial partners and are eager to build connections with academic research teams, innovative technology developers, and visionary industry stakeholders. Through these collaborations, we aim to drive forward breakthrough innovations in sustainable, nutritious, and scalable seafood solutions for the UK and beyond."



HOPPR PROTEIN

"Hoppr Protein is a science-based business committed to advancing research on edible insects through partnerships with universities in the UK and internationally. We are excited to partner with NAPIC to drive innovation and develop sustainable alternative proteins. Together, we look forward to bringing our groundbreaking creations to market."



ERGO BIOTECH

"We are excited to join NAPIC and collaborate in developing innovative solutions in alternative proteins. We strongly believe in the potential of plant cell culture to produce animal proteins and develop new ingredients with improved functionality, optimising flavour, texture, and nutritional value."



MYGROUP

"MYGroup is delighted to join NAPIC as we continue our work with black soldier fly (BSF), bridging the gap between waste management and the rapidly growing alternative protein industry. The company recently oversaw the opening of its first BSF farm, allowing us to fully integrate and scale our bioconversion operations together with food waste recovery processes, all on the same site as a closed-loop."



VALOGEN

"At Valogen, we are at the forefront of transforming agrifood side streams into high-value bioactives. Joining NAPIC is a fantastic opportunity for us to connect with the wider alternative protein sector and to collaborate on research and innovation in the areas of flavouring, nutrition & medical nutrition as well as parallel industry sectors such as cosmetics and pharma."

The Scale-Up Challenge

Three years ago, Innovate UK and Growing Kent & Medway outlined a roadmap for the UK alternative protein sector, identifying scale-up capability as a critical barrier across plant-based, fermentation and cultivated meat sectors—particularly due to high capital costs and limited processing capacity. These challenges persist, with Enabling Sustainable Bioprocessing at Scale identified as one of NAPIC's 6ICs.

A recent briefing from GFI underscores need for infrastructure development. As an example, the lack of infrastructure for pulse fractionation is a key gap in the UK's alternative protein ecosystem. The report highlights that improving access to processing capabilities could have a significant impact on the sector. Limited bioreactor capacity in the UK has also been cited as a key constraint on the growth of the cultivated meat sector. According to a 2025 Parliamentary POSTnote, a lack of infrastructure including bioreactors remains one of the major barriers to commercialisation. As a result, some UK-based cultivated meat companies have opted to expand operations abroad.

"Currently, the UK is experiencing a market failure, whereby farmers aren't incentivised to grow pulses for premium markets, as they cannot be certain of demand, partly due to insufficient infrastructure. Meanwhile, plant-based meat companies can't access British ingredients, which is limiting the UK's ability to diversify its future protein supply. Other alternative protein sectors, including cultivated meat and fermentation, also face critical infrastructure gaps that hinder scale-up and commercialisation. These limitations are collectively restricting the UK's ability to diversify its future protein supply."



Linus Pardoe, Senior UK Policy Manager
THE GOOD FOOD INSTITUTE EUROPE

An example of the high impact that new facilities can have is Novara's oat processing plant in Northamptonshire, which has already boosted the use of British-grown oats in plant-based milks.

Aligned with the UK's Modern Industrial Strategy, the alternative protein sector offers significant potential for sustainable growth, yet the full extent of infrastructure gaps remains unclear. NAPIC believes that alongside the substantial capabilities locked away in its partner ecosystem, further opportunities may exist in underutilised assets such as decommissioned breweries.

To unlock this capability, NAPIC is preparing a UK-wide mapping exercise to identify existing infrastructure across the research-to-commercialisation pipeline, while also assessing national demand to identify critical gaps. These activities will deliver:

- **A Facilities Database** – a comprehensive, accessible map of UK facilities
- **A National Scale-Up Roadmap** – outlining required infrastructure to accelerate commercialisation
- **Advice on Closing the Scaling Gap** – recommendations to guide investment in critical national assets

Together, these outputs will support the UK to build the scale-up capacity essential for growth, job creation and maintaining global competitiveness in alternative proteins.

Governance



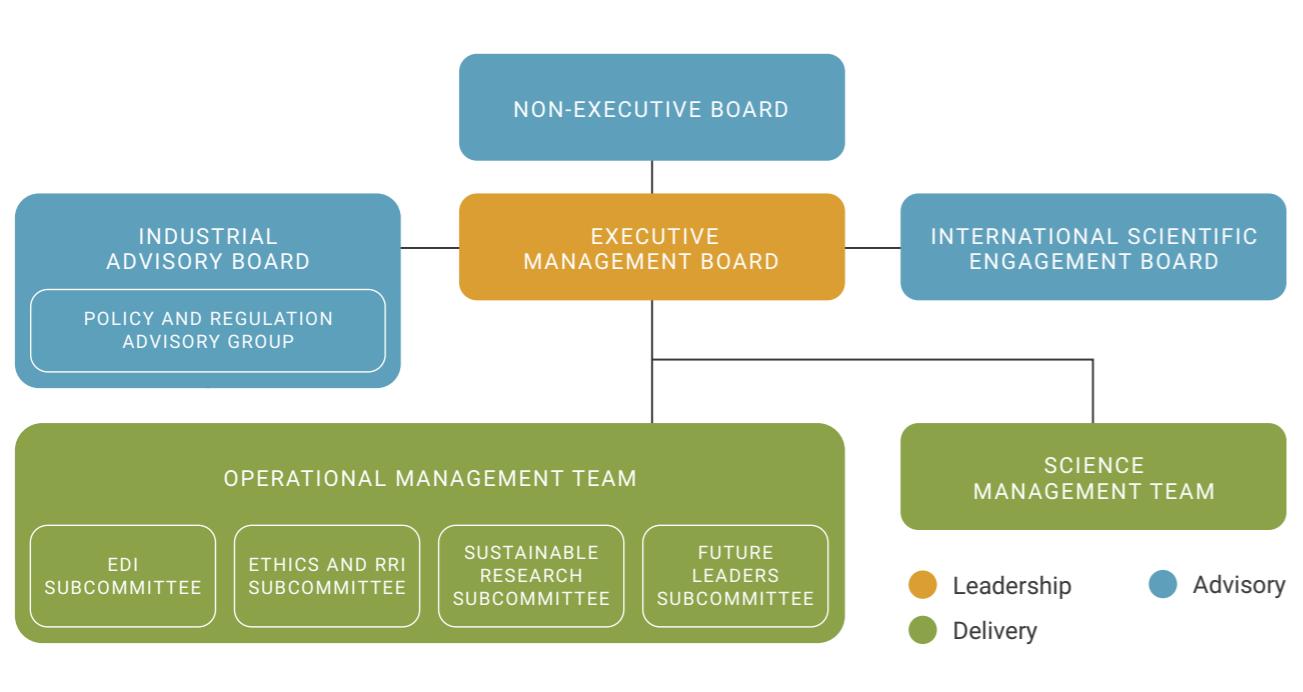
Imran Afzal

NAPIC CEO

Imran Afzal serves as Chief Executive Officer of the National Alternative Protein Innovation Centre (NAPIC), where he leads its strategic mission to accelerate sustainable protein innovation across the United Kingdom. With more than 25 years of experience in research and development and open innovation within the food industry, Imran has held senior roles at PepsiCo - where he directed R&D open innovation strategy and innovation programmes across Europe, similarly at Mondelez and managed private label brands at Tesco, Sainsbury's, and Asda.

He is also the founder of Worth The Squeeze Ltd., a consultancy dedicated to advising start-ups and global food enterprises on strategic growth and innovation.

Renowned for cultivating high-impact collaborations across academia, industry, and policy, Imran has spearheaded hundreds of successful product launches and transformative partnerships. Under his leadership, NAPIC is advancing scalable, future-focused protein solutions by connecting cutting-edge research with practical implementation to reshape global food systems.



NON-EXECUTIVE BOARD (NEB)

The role of the NEB is to guide and challenge the strategic direction and development of NAPIC while simultaneously maintaining oversight of the operation and management of NAPIC and implementation of the Consortium Agreement.

EXECUTIVE MANAGEMENT BOARD (EMB)

The EMB is responsible for formulating, directing, and guiding the implementation of NAPIC's policies and strategies. Comprising the CEO, Operations Director, and the four founding NAPIC Co-Directors, the EMB ensures effective governance and accountability. Additionally, the EMB serves as the owner of NAPIC's risks, overseeing the identification and management of risks associated with NAPIC's operations.

INDUSTRIAL ADVISORY BOARD (IAB)

The IAB reports to the EMB and provides guidance on innovation, translation, commercialisation, and industry impact. Offering insights into industry needs, innovation challenges, policy, best practices, and relevant funding opportunities, the IAB supports NAPIC in aligning its activities with industry demands and advancing the adoption of alternative proteins.

INTERNATIONAL SCIENTIFIC ENGAGEMENT BOARD (ISEB)

The ISEB plays a pivotal role in advancing NAPIC's global strategy for alternative proteins. By fostering international collaboration, strengthening partnerships, and facilitating knowledge-sharing initiatives, the ISEB positions NAPIC as a global leader in sustainable protein solutions.

SCIENTIFIC MANAGEMENT TEAM (SMT)

The SMT supports the scientific delivery of NAPIC, representing the views of UKRI eligible academic members. The SMT plays a key role in shaping NAPIC's research programme in particular the collaborative programme funding.

OPERATIONAL MANAGEMENT TEAM (OMT)

The OMT oversees the day-to-day operations of NAPIC. Tasked with coordinating activities, communications, and opportunities across a diverse consortium of academic, industry, and third-sector partners, the OMT ensures seamless collaboration and effective delivery of NAPIC's mission.

The OMT is supported by four advisory subcommittees. Led by academic champions, these committees ensure that NAPIC develops and embeds best practice approaches in everything that it delivers.

Champions



Science Management Team

Champion



Professor Kieran Tuohy
UNIVERSITY OF LEEDS

Deputy



Dr Rob Hancock
JAMES HUTTON INSTITUTE



International Scientific Engagement Board

Champion



Dr Alan Hernandez Alvarez
UNIVERSITY OF LEEDS

Deputy



Dr Kang Lan Tee
UNIVERSITY OF SHEFFIELD



Future Leaders

Champion



Dr Raul Huertas
JAMES HUTTON INSTITUTE

Deputy



Professor Jerry Y Y Heng
IMPERIAL COLLEGE LONDON



Sustainable Research

Champion



Dr Maria Papathanasiou
IMPERIAL COLLEGE LONDON

Deputy



Dr Frances Sandison
JAMES HUTTON INSTITUE



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Champion



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Champion



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Deputy



Dr Gesa Reiss
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Ethics and RRI

Champion



Dr Sam Caton
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Deputy



Dr James Murray
IMPERIAL COLLEGE LONDON



Equality, Diversity and Inclusion

Champion



Dr Francesca Ceroni
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Deputy



Dr Liz Dinnie
JAMES HUTTON INSTITUE



Financial Sustainability

Champion



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Deputy



Ramin Ebrahimnejad
JAMES HUTTON INSTITUTE

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OPERATIONS DIRECTOR



Helen Arthur
PROGRAMME MANAGER



Kathryn Miller
TECHNOLOGY AND INNOVATION
MANAGER



Dr Fay Stemp-Walsh
IMPACT OFFICER



Adam Lukins
ADMINISTRATIVE SUPPORT
OFFICER



Sameera Rafiq
COMMUNICATIONS AND
OUTREACH MANAGER



Helen Malton
TECHNOLOGY AND INNOVATION
MANAGER



Dr Jyoti Semwal
SKILLS DEVELOPMENT MANAGER



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